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The Canadian Navy: Options for the Future

by

Captain(N) Robert H. Thomas

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PREFACE

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The opinions contained in the papers are those of the participants and do not necessarily represent the views of the Institute and its Board of Directors.

Captain (N) Robert H. Thomas was, during 1991-92, seconded from the Department of National Defence to the Canadian Institute for International Peace and Security. While at the Institute, he examined the future of the Canadian Navy; this paper contains his analysis and major recommendations. All views and analyses presented in this paper are based on information available from public sources, and do not necessarily represent the perspectives and opinions of the Department of National Defence.

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SUMMARY

Since its creation in 1910, the Canadian Navy has varied widely in strength and has been configured to carry out a wide range of roles and tasks at different times. After near extinction in the 1920s, it grew dramatically in World War II, only to be substantially reduced within a few short years after victory. The formation of NATO and the Canadian commitment to the Supreme Allied Commander Atlantic provided the stability for the Navy to develop an effective anti-submarine escort fleet, complete with appropriate air resources, in the 1950s.

Escalating budgetary difficulties and the turmoil surrounding unification took their toll in the late 1960s, and the operational fleet declined steadily in size and effectiveness in the absence of an established, ongoing building programme to sustain it. The abandonment of the 1987 White Paper, largely for budgetary reasons, left the fleet in an increasingly obsolescent state, exacerbated by the delays in the new frigate programme. A new defence policy, announced by the Minister in September 1991, laid out guidelines for the future of the Navy and proposed the creation of a more flexible fleet through the acquisition of new ships and submarines. Based on the defence policy, this paper has been written to examine the premises for a Canadian Navy and to examine options for the fulfilment of the announced policy.

Navies, Canada's included, have traditionally carried out policing, military and diplomatic functions. The emphasis on each is based on national security and foreign policy requirements. These in turn have defined the type of navy a country develops. Based on roles, size and fleet configuration, they can be categorized as:

- **Global navies** -- with a balanced fleet, world-wide reach and organic air and amphibious forces.

- **Ocean-going navies** -- with interests in distant waters and the capability to carry out a single unsupported major operation against all but the most sophisticated opponent.

- **Contiguous sea or regional force projection navies** -- operating as the seaward extension of the national territorial defence zone with some capability to operate beyond the contiguous seas, normally as part of an alliance.

- **Coastal or territorial defence navies** -- limited to operations within the Exclusive Economic Zone.

The Canadian Navy, like most from the developed world, fits into the third category.

Canada has an enormous Exclusive Economic Zone, an extensive Arctic archipelago and abundant off-shore resources to control and protect. Canadian maritime security policy has been based on that protection, particularly in the Arctic, yet Canada is not challenged by a direct military threat. Rather, regional instability and challenges to world order represent the greatest danger to Canadian interests and this has been recognized in Canadian foreign policy.

Choice in creating a new configuration in the fleet is constrained by continuing national fiscal problems. There is no likelihood of significant increases in defence spending and the requirements of the Army and Air Force will compete for available funding.

Canadian foreign policy as enunciated by Clark and McDougall in the past two years has stressed a more international role for Canada in peacekeeping and peacemaking. Canada's longstanding relationship with the United States, its active role in NATO and its support for the United Nations have all been based on an international perspective. Such a position has guaranteed the much-sought-after "seat at the table" in multi-national organizations.

The successful performance of both national and international roles will continue to be a challenge. The acknowledged shortcomings of the existing fleet will persist. There are neither enough ships nor patrol aircraft to carry out all tasks in a fully satisfactory manner and there is little flexibility in the fleet. In part, this has been the result of attempting to maintain a balanced fleet with core capabilities in a variety of roles. Another contributing factor has been the "boom or bust" building programmes with their associated high start up and unit costs.

National requirements call for a substantial surveillance capability and a high degree of responsiveness. The operating environment requires strong ships with good seakeeping capabilities and high endurance. International operations place greater stress on reach and sustainability but do not necessarily demand the capacity for power projection. Foreign operations demand the ability to operate successfully in a multi-threat environment, opposed by navies and air forces equipped with the most modern weapons systems.

Satisfying both national and international requirements requires a fleet which has great flexibility in its structure. Nonetheless, its design must be predicated on fully satisfying national requirements as a first priority. Alliance contributions should not be the driving force behind fleet design. There is no realistic probability that Canada will undertake a major international operation other than as part of an alliance, but there is nothing which demands that Canada contribute to all levels of capability. At the same time, a flexible fleet structure would allow a meaningful contribution.

Based on the 1991 Defence Policy Statement, four general options have been developed to satisfy Canada's maritime requirements. The core elements of the fleet in 1996 provide the starting point; by that time most currently contracted equipment will be in the fleet and the majority of disposals will have been completed. The four options are:

- **A Regional Force Projection Navy** -- This is the option proposed in the 1991 Defence Policy Statement. Acquisitions would include large corvettes, similar to the Vosper Thorneycroft VIGILANCE class, and submarines with Air Independent Propulsion.

- **A Contiguous Seas Navy** -- This option is designed for a more wide ranging international role, yet is fully applicable to national roles. The requirement is based on continuing global instability, growing regional conflict and a more interventionist naval role reflecting Canadian foreign policy in support of the United Nations. Acquisitions would include an additional six frigates in an extended building programme, a new operational support ship and additional medium range coastal patrol aircraft. ANNAPOLIS, NIPIGON and the submarine fleet would be disposed of, the latter without replacement.

- **An Enhanced Territorial Navy** -- This option, in an improving global threat environment but with continued regional instability and an increasing low intensity threat to Canadian security, concentrates on a more nationally oriented role. A Polar icebreaker and a fleet of lightly armed off-shore patrol vessels similar to the British CASTLE class would be acquired, in addition to medium range coastal patrol aircraft and light observation helicopters. ANNAPOLIS, NIPIGON and the submarine fleet would be disposed of without replacement.

- **A Coastal Navy** -- This option presumes an continuing amelioration of the global threat environment, a concentration on a nationally oriented security policy and increasing budgetary constraints. The four TRIBAL class destroyers, ANNAPOLIS, NIPIGON and the submarine fleet would be disposed of. A small fleet of lightly armed off-shore patrol vessels similar to the British CASTLE class off shore patrol vessels would be acquired.

In evaluating the options, the concept of a nationally balanced fleet cannot be supported. Given the already small size of the Navy, attempts at achieving balance will

result in diminished flexibility, reducing the overall capability for national or international operations. With the diminishing threat from the former Soviet Navy, the limited role for submarines in the wide range of low intensity tasks facing the Canadian Navy reduces their utility. Should a high intensity conflict develop, conventional submarines would be at a considerable disadvantage against nuclear powered opponents.

Similarly, corvettes do not make sense. The Canadian requirement is for a relatively large, complex ship. Rather than face the design and start up costs of another ship type, economies of scale in building and in the training of personnel can be achieved be continuing to build frigates at appropriate intervals and working towards a homogenous fleet.

The Canadian Navy of the future cannot satisfy national security requirements if it tries to be all things to all people, thereby fragmenting its capability. To meet national requirements more resources and greater fleet flexibility are required.

The uncertainty of the future challengers the Navy to maintain as much capability and flexibility as possible. This is best achieved by developing the second option, a contiguous seas navy, based on standard designs and as much commonality in systems as possible within the fleet. The Navy should concentrate on a surface fleet with sufficient underway logistic support and strong air surveillance capabilities, affording it the flexibility to carry out both national and international roles within the limits inherent in the foreseeable future.

CONDENSÉ

Depuis la création de la Marine canadienne, en 1910, la puissance de celle-ci a changé considérablement, et sa composition lui a permis de jouer divers rôles et d'exécuter des tâches variées à différentes époques. Après sa quasi-disparition, dans les années 1920, elle s'est énormément développée pendant la Deuxième Guerre mondiale, pour décroître à nouveau de façon substantielle en quelques courtes années après la victoire. La fondation de l'OTAN et l'engagement du Canada envers le Commandant suprême allié de l'Atlantique lui ont apporté assez de stabilité pour permettre la mise en service, dans les années 1950, d'une flotte complète et efficace de bâtiments d'escorte anti-sous-marins et d'un nombre approprié d'aéronefs.

L'intensification des difficultés budgétaires et le bouleversement lié à l'unification ont eu des conséquences néfastes à la fin des années 1960, et la taille et l'efficacité de la flotte opérationnelle ont diminué progressivement, faute d'un programme de construction navale bien établi et continu pour l'étayer. Après l'abandon du Livre blanc de 1987, attribuable en grande partie à des raisons budgétaires, la flotte est graduellement tombée dans un état d'obsolescence exacerbé par les retards du programme de construction de frégates. Dans une nouvelle politique de défense, annoncée en septembre 1991, le ministre exposait des lignes directrices relatives à l'avenir de la Marine et proposait l'acquisition de nouveaux navires et sous-marins pour créer une flotte plus polyvalente. Le présent document examine les justifications d'une Marine canadienne et les options qui s'offrent pour appliquer la nouvelle politique.

Les forces navales, y compris celle du Canada, ont toujours assumé un rôle de surveillance, ainsi que des fonctions militaires et diplomatiques, selon les exigences en matière de sécurité et de politique étrangère, et c'est à partir de ces exigences que chaque pays définit son type de marine. Les marines appartiennent aux catégories suivantes, selon leur rôle, taille et configuration :

- **marine de déploiement mondial** -- composée d'une flotte équilibrée, d'une force aérienne lui appartenant en propre et d'une force amphibie pouvant être déployées dans le monde entier;
- **marine de haute mer** -- peut être déployée dans les eaux éloignées et est capable, à elle seule, de mener une opération contre tout genre de force, sauf les plus sophistiquées;
- **marine de déploiement dans les eaux contiguës ou d'envergure régionale** -- extension en mer de la zone de défense territoriale nationale pouvant mener certaines opérations au-delà des eaux contiguës, normalement en tant que membre d'une alliance;
- **marine de défense côtière ou territoriale** -- opérations limitées à la zone économique exclusive.

La Marine canadienne, comme celles de la plupart des pays industriels, entre dans la troisième catégorie.

Le Canada a une énorme zone économique exclusive, un vaste archipel arctique et d'abondantes ressources en haute mer à surveiller et à protéger. La politique canadienne en matière de sécurité maritime repose sur ce besoin de protection, particulièrement dans l'Arctique, même si le Canada ne doit faire face à aucune menace militaire directe. Ce sont plutôt l'instabilité régionale et les problèmes liés à l'ordre mondial qui menacent le plus les intérêts canadiens, et notre politique extérieure tient compte de ces situations.

Les options relatives à une nouvelle configuration de la flotte sont limitées par les constants problèmes budgétaires du pays. Il est peu probable que les dépenses militaires augmentent de façon considérable, et l'armée et les forces de l'air se disputeront les ressources existantes.

La politique extérieure dont parlent M. Clark et M^{me} McDougall depuis deux ans accentue le rôle international du Canada dans les domaines du maintien et de

l'établissement de la paix. Les relations qui existent de longue date entre le Canada et les États-Unis, la participation active du pays à l'OTAN et l'appui qu'il accorde aux Nations Unies respectent tous l'esprit international. Notre position nous a valu un siège très recherché à la table des organismes internationaux.

Le succès continuera d'être difficile à assurer, tant à l'échelle nationale qu'internationale. Les faiblesses reconnues de notre flotte vont demeurer. Le nombre de navires et d'avions patrouilleurs ne suffit pas pour exécuter toutes les tâches d'une façon parfaitement satisfaisante, et la flotte manque de souplesse. Cette situation est attribuable, en partie, à nos efforts pour maintenir une flotte équilibrée, dotée des éléments fondamentaux lui permettant de jouer des rôles divers. Les programmes de construction navale du «tout ou rien», avec leurs coûts de lancement et leurs coûts unitaires élevés, y contribuent également.

À l'échelle nationale, nous avons besoin d'une capacité substantielle de surveillance et de réaction. Nos théâtres d'opérations nécessitent des navires robustes qui ont une bonne tenue en mer et beaucoup de résistance. Pour les opérations internationales, on insiste davantage sur la portée et la soutenabilité, mais pas nécessairement sur la capacité du pays de projeter sa puissance militaire. À l'étranger, il faut pouvoir conduire des opérations avec succès sur des théâtres qui présentent des menaces multiples et contre des forces navales et aériennes équipées des systèmes d'armes les plus modernes.

Pour satisfaire aux exigences nationales et internationales, une flotte doit avoir une structure très adaptable. Toutefois, sa conception doit, d'abord et avant tout, répondre aux besoins nationaux. Elle ne doit pas être fonction de la participation du pays aux interventions d'une alliance. Il est peu probable que le Canada entreprenne une opération militaire internationale importante autrement que dans le contexte d'une alliance, mais rien ne l'oblige à contribuer à tous les degrés de capacité navale. Parallèlement, une structure adaptable permettrait à la flotte d'apporter une collaboration appréciable.

Quatre options générales ont été définies à partir de l'énoncé de politique de défense de 1991 pour répondre aux besoins du Canada en matière de marine. En 1996, la structure de la flotte reposera sur des éléments centraux; la plupart des bâtiments en chantier aujourd'hui auront été livrés et la majorité des désarmements prévus auront été effectués. Les quatre options sont :

- **une Marine de déploiement régional** -- il s'agit de l'option proposée dans l'énoncé de politique de défense de 1991. La Marine acquerrait, entre autres, des grosses corvettes, semblables aux bâtiments de la classe *Vosper Thorneycroft VIGILANCE*, et des sous-marins à propulsion anaérobie.
- **une Marine de déploiement dans les eaux contiguës** -- cette option permettrait à la Marine de jouer un rôle international plus vaste, tout en satisfaisant pleinement aux exigences nationales. Elle a été définie en fonction de l'instabilité mondiale continue, de l'aggravation des conflits régionaux et d'une intervention navale accrue, conformément à la politique extérieure du Canada, qui préconise que le pays accorde son appui aux Nations Unies. La Marine acquerrait, entre autres, six frégates supplémentaires grâce à un programme de construction navale élargi, un nouveau bâtiment de soutien opérationnel et d'autres aéronefs de patrouille côtière à moyenne autonomie. L'*ANNAPOLIS*, le *NIPIGON* et la flotte de sous-marins seraient désarmés, ces derniers n'étant pas remplacés.
- **une Marine territoriale perfectionnée** -- dans une conjoncture mondiale moins menaçante, assortie, toutefois, d'une instabilité régionale continue et de la menace croissante, mais de faible intensité, à la sécurité canadienne, cette option est axée sur un rôle national accru. Elle supposerait l'acquisition d'un brise-glace polaire et d'une flotte de patrouilleurs hauturiers dotés d'armes légères, semblables aux patrouilleurs hauturiers britanniques de la classe *CASTLE*, en plus d'aéronefs de patrouille côtière à moyenne autonomie et d'hélicoptères de reconnaissance légers. L'*ANNAPOLIS*, le *NIPIGON* et la flotte de sous-marins seraient désarmés et ne seraient pas remplacés.

- **une Marine côtière** -- cette option suppose une conjoncture mondiale de moins en moins menacée, une politique axée sur la sécurité nationale et des restrictions budgétaires de plus en plus importantes. Les quatre destroyers de classe *TRIBAL*, l'*ANNAPOLIS*, le *NIPIGON* et la flotte de sous-marins seraient désarmés. La Marine acquerrait une petite flotte de patrouilleurs hauturiers dotés d'armes légères, semblables aux patrouilleurs hauturiers britanniques de la classe *CASTLE*.

En examinant ces options, il est impossible de soutenir l'idée d'une flotte nationale équilibrée. La Marine étant déjà de petite taille, les efforts pour réaliser un tel équilibre en diminueront la souplesse et en réduiront la capacité générale de conduire des opérations nationales ou internationales. Avec la diminution de la menace que constituait l'ancienne Marine soviétique, le rôle limité des sous-marins dans les diverses tâches secondaires qui attendent la Marine canadienne réduit leur utilité. Si un conflit majeur éclatait, les sous-marins classiques seraient considérablement désavantagés par rapport aux sous-marins nucléaires de l'ennemi.

De même, l'acquisition de corvettes n'a aucun sens. Le Canada a besoin d'un navire relativement gros et complexe. Au lieu de payer les frais de conception et de lancement d'un autre type de navire, il serait possible de réaliser des économies d'échelle dans la construction de bâtiments et la formation de personnel en continuant de construire des frégates au moment voulu et en visant la création d'une flotte homogène.

La Marine canadienne de demain ne pourra répondre aux besoins nationaux en matière de sécurité et aux attentes de tout un chacun. Sa capacité s'en trouvera fragmentée. Pour satisfaire aux exigences nationales, des ressources supplémentaires sont nécessaires, de même qu'une flotte plus adaptable.

L'incertitude de l'avenir force la Marine à maintenir le plus de capacité et de souplesse possible, ce qui sera faisable en adoptant la deuxième option, soit une Marine

de déploiement dans les eaux contiguës, bâtie selon des plans standard et munie de systèmes qui s'appliquent, autant que possible, à toute la flotte. Elle doit essayer, avant tout, de se doter d'une flotte de surface, d'un soutien logistique en mer suffisant et d'une bonne capacité de surveillance afin de s'assurer la souplesse nécessaire pour s'acquitter de sa tâche à l'échelle nationale et internationale, dans les limites qui lui sont propres, et dans un avenir rapproché.

INTRODUCTION

> *"...in military matters, we have had little choice but to seek our security through cooperation with others.... We have always recognized that it is not here that wars will start or peace will be made. Those choices will be made far away from Canada -- but we will be either the victims of conflict or the beneficiaries of peace."*
>
> The Right Honourable Joe Clark[1]

For over eighty years the Canadian Navy has contributed to national security by direct defence of Canadian maritime interests, by participation in combined naval operations with allied navies and by acting as a diplomatic instrument in support of foreign policy. The latter role has been a major influence in establishing the structure of the Navy and has, until recently, provided a constant and reassuring perspective for strategic planning.

Mr. Clark's comment is in stark contrast to the sentiments voiced by Senator Dandurand to the League of Nations in 1924, where he said, "We live in a fireproof house, far from inflammable materials. A vast ocean separates us from Europe". While the vast oceans still protect and separate Canada from the many troubled areas of the world where the causes and resolution of conflict will occur, they also still link Canada to those areas and have themselves become areas of conflict.

The promulgation of a new defence policy coincident with profound changes in the global strategic situation presents new challenges to the Navy. The rapidly evolving security environment and political changes in key regions of the world clearly demand a review of the national maritime security requirements. This, in turn, requires a review of the rationale for the Navy.

This paper will examine the emerging contemporary roles of navies in general, discuss Canadian maritime security interests, and review appropriate options for Canada's Navy of the future.

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[1] Joe Clark, "Canada in the World: Foreign Policy in the New Era", notes for a speech on the occasion of the 66th Meeting of the Canadian American Committee of the C.D. Howe Institute, Ottawa, 13 September 1990.

I BACKGROUND

The Early Years of the Royal Canadian Navy

From the time of the British conquest until the early twentieth century, Canada's maritime security was provided by Great Britain. The Royal Navy defended the British Empire with the various colonies, including Canada, providing little more than secure coaling bases. Faced with a growing German naval threat in the late nineteenth century, Britain started a substantial and financially demanding shipbuilding programme; at the same time it began to reduce or eliminate its overseas obligations. The Dominions were expected to see to their own defence. Canada created the Naval Service (soon to be re-named the Royal Canadian Navy) on 4 May 1910. The ill-considered, and ultimately unfulfilled, proposal to contribute money to the Royal Navy for three dreadnoughts instead of building or buying ships[2] delayed the development of a Canadian fleet. As a result, when war broke out in 1914, Canada found itself with only two obsolete cruisers, and the RCN concentrated on developing a small escort force during the war, operating primarily in local waters.

Following the war the Admiralty continued to press for an Imperial navy, but this was rejected by the Dominions. Admiral Lord Jellicoe visited Canada in 1919 to make recommendations on Canadian naval policy.[3] He submitted four plans to the Government which ultimately decided to carry on with a small navy similar to the pre-war one. Not for the last time, the financial situation in the country dictated policy. During the inter-war years the RCN was reduced to the brink of oblivion, sustained almost entirely through the reserve Naval Divisions.

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[2] Gilbert N. Tucker, *The Naval Service of Canada, Vol. I*, Ottawa, King's Printer, 1952, p. 101, 188-197. The debate on the Naval Aid Bill in Parliament continued from November 1912 until May 1913. It was ultimately defeated in the Senate.

[3] *ibid*, pp. 304-321.

World War II

After a modest expansion programme in the 1930s, the fleet comprised six British-built destroyers, five minesweepers and two smaller craft by 1939. Rapid growth of the fleet continued through the War. The Navy, largely manned by Reserves, concentrated on the escort role in the North Atlantic, at the same time expanding into fleet destroyer operations and carrier aviation. By 1945 the RCN was one of the largest Allied navies, with 470 vessels commissioned and 100,000 personnel. The RCN commanded the North-West Atlantic and contributed substantially to the successful prosecution of the Battle of the Atlantic.

As the war progressed and the Navy matured, planning commenced for the post-war Navy. Proposals were developed in Naval Service Headquarters in 1943 for a fleet of four cruisers, two light fleet carriers, and sixteen fleet destroyers to defend North America and carry out a variety of international tasks, far beyond those envisioned by the government.[4] These ambitious plans were rejected by the Cabinet War Committee in 1945 and, with the end of the war, the size of the Navy rapidly declined.

Post-War Developments

During and after the Second World War, Canadian strategic maritime development continued to be conditioned by the Navy's strong British naval heritage. Its later relationship with the United States, the stability created by the Cold War and the superpower standoff served to alter this influence. The formation of NATO in 1949 in response to the Soviet threat gave impetus to new developments. The role of the Navy was defined as the protection of Canadian and allied shipping and Canadian coastal waters under the overall command of the Supreme Allied Commander Atlantic (SACLANT).[5] This role was to endure for the duration of the Cold War, with the Canadian participation in Alliance surveillance of the Soviet submarine fleet representing

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[4] S. Mathwin Davis, "The 'St Laurent' Decision: Genesis of a Canadian Fleet", in W.A.B Douglas, ed. *RCN in Transition 1910-1985*, Vancouver, The University of British Columbia Press, 1988, pp. 189-90.

[5] *ibid*, p. 191.

the national naval contribution to strategic deterrence. The secondary role took on greater significance in the late fifties and early sixties when Soviet missile-launching submarines regularly deployed to North American waters. At the same time, such roles did not preclude the prompt dispatch of destroyers to Korea in 1950 and their maintenance in-theatre until 1953.

The escort role was enhanced by the commissioning of the ST LAURENT class of destroyer-escorts and its successors between 1955 and 1964. Nonetheless, there were concerns within the Navy about the adequacy of existing facilities and future plans. The Ad Hoc Committee on Naval Objectives was established under the direction of the Vice Chief of the Naval Staff, Rear Admiral J.V. Brock. Its report, in July 1961,[6] (the Brock Report), called for a fleet of twelve submarines (half of them possibly nuclear powered), eight general purpose frigates, twelve "heliporter" frigates (each carrying 14 helicopters) and two Arctic patrol vessels. It called, as well, for the return of the icebreaker, HMCS LABRADOR from the Coast Guard and the upgrading of the new destroyer-escorts to carry helicopters.

The Post-War White Papers

The 1964 White Paper[7] addressed the major issue of the integration of the Armed Forces. It did not endorse the recommendations of the Brock Report, but planned the continuation of the anti-submarine role in which the RCN had become expert. Systems development was emphasized, continuing the world-leading progress in the use of helicopters on anti-submarine escorts, sonobuoys and variable depth sonar. The White Paper also discussed the feasibility of building two or three nuclear powered submarines,

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[6] Government of Canada, *Report of the Ad Hoc Committee on Naval Objectives, 1961*, Ottawa, Directorate of History, 81/481. See also Lieutenant-Colonel Douglas Bland, "Continuity in Canadian Naval Policy 1961-1987", *Canadian Defence Quarterly*, April 1989, pp. 29-32. Bland compares the recommendations of the Brock Report with the proposals in the 1987 White Paper, suggesting that there is an enduring tendency of naval planners to adhere to the same objectives and roles, focussing on a mixed, versatile fleet and the capability to conduct high intensity operations, unless given political direction to do otherwise.

[7] Government of Canada, *White Paper on Defence*, Ottawa, Department of National Defence, 1964.

primarily as anti-submarine weapons.[8] It was emphasized, however, that naval requirements would continue to be directly related to alliance contributions, and that a "modern and well-equipped fleet of appropriate size" was to be maintained.

A new White Paper in 1971[9] followed a period of intense turmoil in the Navy. Integration and subsequent unification had had a devastating impact on morale, exacerbated by the dismissal or resignation of key senior officers. There were manpower problems and the number of major warships had declined from 44 in 1963-4 to 24. The General Purpose Frigate programme had been cancelled in 1963[10] and the announcement of the acquisition of four TRIBAL class destroyers in 1965 was small consolation, despite their being modern, capable ships. The disposal of HMCS BONAVENTURE in 1970 marked the end of carrier aviation, although the TRACKER aircraft were retained for coastal surveillance, augmenting the ARGUS fleet.

From a naval perspective, the 1971 White Paper placed greater emphasis on sovereignty and defence of North America and reduced the NATO role. It called for increased surveillance capability in the Arctic and raised the question of sub-surface surveillance in the Arctic approaches. Control of activities in the territorial seas was stressed, noting the requirement for cooperation with other government departments. Such activities were also seen as contributing to strategic deterrence, in opposition to the growing fleet of Soviet missile-launching submarines.

Despite the more nationally oriented focus of the White Paper, the NATO role continued to hold centre stage for the Navy. Most planning effort was directed towards

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[8] *ibid*, p. 23. The decision had been taken in 1962 to acquire three conventionally powered OBERON class submarines from Britain.

[9] Government of Canada, *Defence in the 70s*, Ottawa, Department of National Defence, 1971

[10] Rear Admiral S. Mathwin Davis, "Cancellation of the General Purpose Frigate: Lessons From a Quarter Century Ago", *Canadian Defence Quarterly*, June 1990, pp. 61-70. See also Peter Haydon, "When Military Plans and Policies Conflict: The Case of Canada's General Purpose Frigate Problems", *The McNaughton Papers Volume II*, Toronto, Canadian Institute of Strategic Studies, 1991.

NATO, and the Navy (on the East Coast) had adopted NATO operating procedures. After some initial hesitation, NATO's concept of a Standing Naval Force Atlantic had been endorsed in 1968,[11] and Canada had routinely participated with both ships and staff.

The advent of double-digit inflation in 1973 played havoc with the announced concept of formula financing for the defence budget. Faced with cutbacks in personnel and capital spending, the Government ordered the Defence Structure Review.[12] After a year long study, the Minister announced on 27 November 1975, that the Canadian Forces would be maintained at 78,000 and that 18 new maritime patrol aircraft would be acquired to replace the ARGUS and new main battle tanks purchased for the Army in Europe. The review of studies concerning replacement of fighter aircraft and ships would continue.

Meanwhile the fleet was aging. The British experience in the Falklands demonstrated the vulnerability of ships to missile attack as well as the damage control problems caused by the use of certain materials in construction.[13] Prompted by these and other circumstances, the Sub-committee on National Defence of the Standing Senate Committee on Foreign Affairs carried out an extensive review of the Navy in 1983.[14]

The sub-committee report expressed alarm at the deterioration of the Navy and called for a new White Paper which would clearly state defence policy and priorities. It recommended, *inter alia*, that:

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[11] J.A. Fulton, "The Origins of the Standing Naval Force Atlantic", in Robert N. Huebert, Susan J. Rolston and Fred W. Crickard, eds. *NATO: A Maritime Alliance -- Proceedings*, Halifax, International Insights Society, 1989, pp. 35-42.

[12] C.J. Marshall, "Canada's Forces Take Stock in Defence Structure Review", *International Perspectives*, January/February 1976, pp. 26-30.

[13] The Canadian Navy had been aware of the damage control hazards since the explosion and fire in HMCS KOOTENAY in 1969. The RN had been advised at the time of the lessons learned.

[14] Government of Canada, *Canada's Maritime Defence: Report of the Sub-committee on National Defence of the Standing Senate Committee on Foreign Affairs*, Ottawa, 1983.

- protection of Canadian sovereignty be expanded to explicitly provide for the defence of Canada;
- maritime forces be equipped to carry out sea denial roles in waters claimed by Canada;
- a capability to make a full maritime contribution to NATO be re-acquired while maintaining the capability for defence of Canada and North America;
- a balanced fleet be developed through the acquisition of new frigates, maritime patrol aircraft, conventional submarines and minesweepers; and,
- a mobilization plan be developed and promulgated.

A new White Paper, *Challenge and Commitment*,[15] was issued in 1987. It explicitly acknowledged that the Navy was largely obsolete, had too few ships and maritime patrol aircraft, no minesweeping capability and limited Arctic operating capability.

The 1987 White Paper developed the concept of the three ocean Navy, with the requirement to respond to challenges in home waters as well as contribute to the collective security of the Alliance. In large part, this was to be done by continuing the role of protecting the sea lines of communication to Europe. At the same time, operations in the Pacific were to be strengthened and, with the acquisition of nuclear-powered submarines, an active role was to be developed in the Arctic. An ambitious ship-building programme would be carried out to develop a modern, balanced and flexible fleet.

Within two years the increasing financial difficulties of the Government, coupled with dramatic changes in the strategic climate, led to the abandonment of fundamental elements of the programme. An extensive departmental review followed, complicated and delayed by the Oka crisis, the Gulf War, the review of NATO's strategy and military structure, and conflicting views on force requirements within National

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[15] Government of Canada, *Challenge and Commitment. A Defence Policy for Canada*, Ottawa, Department of National Defence, 1987.

Defence Headquarters.[16] A new statement of defence policy was promulgated on 17 September 1991.

The statement of Canadian defence policy[17] revealed the framework of Department of National Defence plans to defend Canada's security interests, at home and abroad. In the naval aspects of defence policy, greater emphasis was placed on operations in Canadian areas of responsibility on both the East and West coasts, with the aim of "ensuring that we maintain the capability to exercise control over these Canadian waters". This emphasis was amplified at the press conference following the Minister's statement, where the Chief of the Defence Staff, General A.J.G.D. de Chastelain, commented that the Canadian Forces were now structuring themselves "...to keep alive and readily expandable, the key elements of a blue water navy, as well as a coastal defence navy...."

The policy calls for the Navy to be equipped over the next 15 years with up to 16 Frigates and destroyers, up to 4 of a planned total of 6 corvettes, up to 12 coastal patrol vessels and up to 3 of a planned total of 6 conventionally powered submarines. A better apportionment of ships between coasts will be pursued, as will a balance among air, surface and sub-surface assets. It is intended to develop a versatile, flexible fleet, rather than one designed specifically for protection of the sea lines of communication. Although the links to NATO are re-affirmed, the previous emphasis on anti-submarine warfare and escort work is diminished. Regular Force strength will remain at 10,000 and the Naval Reserve will increase from 4,500 to 5,000. There will be a greater effort to integrate Reserve personnel into ships and establishments. It is intended to develop an increased surveillance capability in the Arctic, and to increase the capability to support other government departments for fisheries protection, drug interdiction, environmental monitoring, apprehending illegal immigrants and protecting economic zone resources.

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[16] These resulted in the resignation of Vice Admiral C.M. Thomas, Vice Chief of Defence Staff, in April 1991. The principles in dispute were detailed in his letter of resignation and the reply from General A.J.G.D. de Chastelain, Chief of Defence Staff, both released to the public.

[17] Statement by the Honourable Marcel Masse, Minister of National Defence, 17 September 1991.

The promulgation of the 1992-1993 federal budget, while accelerating the withdrawal of troops from Europe and cutting some other activities, did not propose changes to the naval capital programme.[18]

While this may represent a clear vision of what Canada's Navy will become over the next fifteen years, will it be the right fleet for the job? More to the point, what will be the right job? Does the model satisfy purely national requirements? Does it take into account the full range of maritime operations which may be required in support of joint and combined operations? Will the Canadian contributions to alliance security be appropriate and significant?

Canada's choices are hardly free. The country is inextricably linked to the United States, its greatest trading partner and closest (if occasionally insensitive) friend and ally. The declared intention is to maintain the ties with Europe which have roots going back to the earliest days of the country. The Asia-Pacific area has increased steadily in importance in Canadian foreign policy through the last decade. The multinational approach to global security has been supported through membership in the United Nations and NATO and, most recently, the Organization of American States, where Canada has already taken strong positions on area security matters.

In its strategic maritime thinking, however, has Canada simply fallen into the trap of adopting a scaled-down version of the maritime strategies of the UK and US? The unique challenges faced by Canada include an enormous maritime area, little public understanding or appreciation of its scope, significance or challenging environment, a geographic position invariably placed between the major powers (regardless of their alignment), and a navy which has declined significantly in size as its range of responsibilities has remained largely unchanged.

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[18] Honourable Don Mazankowski, *1992 Budget -- Statement to the House of Commons*, 24 February 1992.

The release of the latest defence policy statement generated considerable comment in the media and amongst strategic analysts. The vast majority addressed the reduction of the Canadian Forces in Europe, elimination of personnel, and base closures. Little public attention was paid to the future of the Navy, other than acknowledging equipment procurement plans. What has been largely ignored in the discussion is what the various roles should be in such turbulent times, and how they should be carried out as elements of a national security policy. It is therefore appropriate to examine the rationale for a national navy and develop options for its future.

What, then, do modern navies do? What are Canada's maritime security interests and what should Canada require in its Navy to advance and protect them?

II MARITIME THEORY AND THE CANADIAN CONTEXT

Most work published on maritime strategic thought in recent decades has been American or British. The Americans have addressed their attention almost exclusively to the Maritime Strategy,[19] which described the concept of operations and the global role of the United States Navy, based on the Soviet threat and the superpower responsibilities of the United States. A few scholars and strategists have looked at the roles of other (and smaller) navies and have considered the options for their roles and structures. British writers, often conditioned by the reduction in size and commitments of the Royal Navy, have tended to give greater consideration to the problems of smaller navies with a more limited range of roles and capabilities.

In Canada, analysts have tended to concentrate on the perceived deficiencies of the existing fleet without developing a rationale for its future roles or structure. Little attention has been paid to possible alternatives which might be appropriate in light of the dramatically different strategic environment.

A key factor in changing the rationale for, and structure of, national navies was the 1982 Convention of the Law of the Sea developed in the Third United Nations Conference on the Law of the Sea. The expansion of national maritime interests to include a 200 nautical mile Exclusive Economic Zone expanded the world potential for maritime boundaries to 412, of which only 118 were covered by agreements as late as mid-1988.[20] The boundary problems and concern for off-shore resources gave an impetus to the creation, re-configuration or growth of navies around the world as nations sought to take control of all activities within their expanded areas of jurisdiction. At the same time, the assumed prerogatives of the more powerful maritime nations have been

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[19] Admiral James D. Watkins, "The Maritime Strategy", supplement to *United States Naval Institute Proceedings*, January 1986.

[20] S.P. Jagota, *Competing Concepts of Maritime Boundaries: A Global Outlook*, speech to Conference on Maritime Interests, Conflict, and the Law of the Sea, Halifax, 20-23 June 1991.

challenged.[21] In attempting to deal with the variety of new roles and relationships which have evolved rather quickly, scholars have attempted to define roles and classify navies by type, based on the range of capabilities they possess and the real and imposed limitations placed on them.

Functions of Navies

R.B. Byers described the three key aspects of a national maritime policy as geographic, economic, and military-strategic.[22] He noted the lack of a national perspective on maritime affairs in Canada and saw this reflected in a lack of interdepartmental cooperation, with no incentive for mutual support, cooperation or coordinated planning.

In examining the roles of the United States Navy, Admiral Stansfield Turner pursued the argument that it was more important to focus on output rather than input and developed a hierarchy of broadly stated missions areas which are generally applicable to all navies.[23] These are:

- Strategic deterrence -- to deter all-out attack on the United States or its allies, pose an unacceptable risk to aggressors and create a stable international political environment.
- Sea control -- to assert control of ocean areas vital to the United States and deny such control to an enemy.

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[21] Nien-Tsu Alfred Hu and James K. Oliver, "A Framework for Small Navy Theory: The 1982 U.N. Law of the Sea Convention", *United States Naval War College Review*, Spring 1988, pp. 41-43. The authors argue that it was the creation of the 200 nm EEZ which has had the greatest influence on the world-wide development of navies. See also Ken Booth, *Law, Force and Diplomacy at Sea*, (London: George Allen & Unwin, 1985, chapters II & VII, and Capt. Robert G. Moore, "Coastal Security", *Journal of Defence and Diplomacy*, Vol 6 No 11, November 1988, pp. 41-2.

[22] R.B. Byers, "An 'Independent' Maritime Strategy for Canada", *Canadian Defence Quarterly*, Summer 1988, pp. 19-32. See also Rear-Admiral F.W. Crickard, "Oceans Policy and Maritime Strategy", *Canadian Defence Quarterly*, April 1990, pp. 15-19 and Cmdr. Peter Haydon, "Towards a Maritime Strategy for Canada", *Forum*, September 1990, pp. 17-18.

[23] Vice Admiral Stansfield Turner, "Missions of the U.S. Navy", *United States Naval War College Review*, March/April 1974, pp. 2-17.

- Projection of power -- to utilize the impact of sea forces on land forces.
- Naval presence -- to use naval forces, short of war, to achieve political objectives by deterring actions inimical to national interests or encouraging actions in the national interest.

Ken Booth[24] expanded on these missions in a global context. He argued that navies have three functions:

- A policing function to facilitate the use of the sea for passage and exploitation of resources.
- A military function to threaten or use force.
- A diplomatic function in the management of foreign policy short of war.

Others[25] have either expanded on these functions or introduced additional concepts, primarily strategic deterrence and intelligence gathering. From these have been derived the range of roles which an individual navy may fulfil, dependent on national requirements and the actual structure of the navy.

Types of Navies

Booth[26] describes four types of navies based on these naval roles and tasks:

- Global navies -- with the potential for deployment on a world-wide basis without denuding the maritime forces required for maritime defence in the contiguous seas. Such navies depend on a balanced fleet with organic air power

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[24] Ken Booth, *Navies and Foreign Policy*. London, Croom Helm, 1977, pp. 15-25.

[25] See James Cable, *Gunboat Diplomacy 1919-1979*, London, The Macmillan Press, 1981 pp. 41-83; Rear Admiral J.R. Hill, Maritime Strategy For Medium Powers, Annapolis, Naval Institute Press, 1986, pp. 992-148; Michael A. Morris, *Expansion of Third World Navies*, London, Macmillan, 1987, pp. 16-17; and Geoffrey Till, Maritime Strategy and the Nuclear Age, London, The Macmillan Press, 1984, pp. 181-221.

[26] Ken Booth, op.cit., pp. 120-121.

and amphibious forces. They reflect world-wide national interests. These are essentially limited to the US Navy and the Soviet Navy, but even they are facing internal challenges to their global roles.

- Ocean-going navies -- have some interest in distant waters and have sufficient strength to carry out a single major operation without support in such areas against all but the most capable and sophisticated opponent. The Royal Navy and French Navy are prominent examples.
- Contiguous sea navies -- operate as the seaward extension of the national territorial defence zone. Their strategic view is normally developed within alliances or under the protection of a major power. Most of the navies in the developed world fit this category.
- Coastal navies -- function primarily as a coastguard with only limited capabilities to deter a modest naval intrusion. Most are in the Third World or in very small nation states.

A somewhat different approach is taken by Michael Morris.[27] Although his analysis is devoted to Third World navies and is open to challenge on the basis of such categorization, his ranking system and the implied capabilities are complementary to the process used by Booth. He ranks navies in six types:

- Rank 6: regional force projection navies -- have substantial territorial defence capabilities with some capability to operate beyond the contiguous seas.
- Rank 5: adjacent force projection navies -- similar capabilities to Rank 6, but limited to some ability to operate beyond the Exclusive Economic Zone.
- Rank 4: offshore territorial defence navies -- substantial capabilities to defend out to the limits of the Exclusive Economic Zone.
- Rank 3: Inshore territorial defence navies
- Rank 2: Constabulary navies
- Rank 1: Token navies

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[27] Morris, *Expansion of Third World Navies*, op. cit. pp. 16-20.

Morris arbitrarily defines Rank 5 and 6 navies as having more than 15 major warships and/or submarines, with decreasing numbers for those of lower rank.

An instructive discussion of ocean-going navies is provided by James Cable in *Navies in Violent Peace*.[28] He argues, first, that only nations whose ambitions go beyond "estate management" should even consider the creation of an ocean-going navy and few of them have any real chance of putting their ideas into effect. Second, the "true test of such a navy is its ability to sustain distant combat with a likely enemy". He notes that this, in the broadest context, is only within the capability of a superpower. Third, he notes that an ocean-going navy must not only have the capability to fight in distant seas, but must also have the endurance, logistics support and fleet size to accommodate the absence of the fleet from home waters. It should be noted that Cable concentrates on naval capabilities of a single state and does not pursue those of a coalition.

The discussion of this wide range of potential roles and tasks, for the most part, deals with activities in situations short of global war. These are defined by Cable as:

> the use or threat of limited naval force, otherwise than as an act of war, in order to secure advantage, or to avert loss, either in the furtherance of an international dispute or else against foreign nationals within the territory or the jurisdiction of their own state.[29]

While the ultimate *raison d'être* of navies is war-fighting, this capability is rarely utilized directly in low intensity operations which occupy the greatest proportion of their time. As a result its value may be down-played in some eyes. Such capability may, however, contribute substantially to effectiveness in peacetime as it adds the deterrent element to all operations. Further, it cannot be quickly created in a crisis.

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[28] James Cable, *Navies in Violent Peace*, London, Macmillan, 1989, pp. 102-3.

[29] Cable, *Gunboat Diplomacy*, op. cit. p. 39.

What Type of Navy for Canada?

The Canadian Navy has been either a contiguous sea or a regional force projection navy for some considerable period of time. The planned fleet, reduced in size and underway logistic support, clearly anticipates the continuation of this type of navy. It is the consideration of the capability to carry out distant operations which has been, and will continue to be, a great challenge to Canadian naval planners. Commitments or potential contributions to alliances will continue to influence decisions; however such plans need not consider fulfilling all roles.

The Policing Function

The 1991 defence policy statement requires that the Navy be capable of fully carrying out the policing function. This is the least glamorous and attractive of the three generic roles, but, in many respects, it may be the most important from a national perspective. There are several elements to this function, including:

- The capability to detect and monitor activity within Canada's area of interest. This is the keystone of sovereignty. Without such a capability and the associated command and control structure, the nation's effective control of its territory is jeopardized.
- The protection of resources and personnel through the consistent application of laws and regulations. This may include the protection and supervision of the Exclusive Economic Zone, upholding national positions over disputed boundaries/lines of demarcation and, ultimately, the enforcement of national positions on the straits issue in the Arctic.
- The prevention of illegal immigration, smuggling and other illicit activities within claimed waters.
- The provision of assistance to the civil authority, such as search and rescue and other forms of disaster relief. Inherent in this role is the requirement for close cooperation with other government agencies.

The Military Function

The military function is more complex and comprehensive. Conditions in local operating areas require it to have a blue water sea-keeping capability. The planned fleet will have little capability to carry out any but low intensity operations on a unilateral basis. Participation in collective security or defence operations will continue to influence decisions on ship types and fleet composition. Ultimately, however, the degree to which some or all of the full range of military roles can be carried out will decide whether or not to join with allied nations in time of war and the nature of the naval contribution. The decision will also depend on allied cooperation in providing operational and logistic support as well as full access to shore facilities.

The military function includes the full range of the ordered applications of violence in support of the Canada's security. These may include:

- Demonstrations of national power, will and resolve.
- Protection and evacuation of nationals abroad in times of crisis.
- Sea denial, to prevent others from using ocean areas regarded vital to the national interest. This can include the protection of convoys and other associated actions in protecting sea lines of communication as well as interdiction, blockade or embargo.
- Sea control, permitting unimpeded national use of sea areas, generally for a limited period of time and in a limited area.
- Contributions to strategic deterrence through surveillance operations.

The Diplomatic Function

The diplomatic function entails the use of naval forces in the implementation and application of foreign policy short of the application of force. This may include:

- Naval presence in times of escalating tension.
- Cooperation with the navies of friendly countries.
- Port visits in support of national objectives.

III CHALLENGES TO CANADIAN MARITIME SECURITY

Canada as a Maritime Nation

Almost without exception, the view that "Canada is a maritime nation" is presented as a matter of fact. The premise is that having a long coastline bordering on three oceans, an enormous Exclusive Economic Zone[30] and an economy heavily dependent on foreign trade[31] automatically makes us one. More accurately, as Peter Haydon argues,[32] "one could call Canada a maritime state with a landlocked mentality". The lack of a comprehensive maritime policy, the fragmentation of responsibility within the various interested governments and their departments,[33] and the relentless decline of both the deep-sea merchant fleet and the ship-building industry[34] all give evidence of a country which, distracted by other issues, has no understanding of the sea or its strategic importance in Canada's future.

By virtue of its unique geographic position Canada faces security questions quite unlike those faced by similar maritime powers. Even with the end of the Cold War, the country still finds itself interposed between the two nuclear superpowers. The strategic threats to the United States are threats to Canada, and must be recognized as such. This has had the effect of influencing Canada to perform certain military roles only because the alternative would be their performance by the United States. In the realm of

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[30] See Appendix I for details. The oft-quoted coastline measurement of 244,000 km includes the circumference of all major and minor islands as well as the mainland coastline. The more important measurement is that of the area of the EEZ. The East Coast encompasses 2,500,000 km^2, the Arctic 3,000,000 km^2, and the West Coast 150,000 km^2.

[31] See Appendix I. Canada's trade is predominantly with the United States which receives 75% of Canadian exports and provides 70% of imports. The proportion of trade with Europe has grown slightly in the past five years while it has remained constant with Asia during the same period.

[32] Commander Peter Haydon, "The Future of the Canadian Navy", *Canadian Defence Quarterly*, December 1990, p. 8.

[33] Naval Officers Association of Canada, Ottawa Branch, *A Maritime Policy for Canada*, Ottawa, 1990. See especially Chapter III, "The Federal Government and the Marine Management Process" which details the involvement of some 14 government departments and agencies.

[34] See Appendix I for details.

economics and trade, the Canadian economy is so closely tied to that of the United States that Canada must reconcile its activities to theirs. In many cases, however, it is the Americans who pose the greatest economic as well as sovereignty-related challenges. Canadian maritime security problems can therefore be broken down into two distinct areas -- where activities threaten international stability and where they pose direct threats to local Canadian interests.

Future Trends

Several studies have been carried out within the Department of National Defence to analyze the impact of trends on the Canadian Forces.[35] They highlighted, *inter alia*, the growing global instability, driven by changing political and economic centres of power, excessive population growth, inequitable distribution and availability of food, water and energy and continuing racial, ethnic and religious animosities. Hunger, intolerance and violence have the potential to create more political and economic refugees whose movements challenge authorities, both in terms of law and order, and in coping with the unexpected social requirements of accommodating them. Characteristic of many of the trends is the increasing inability of existing institutions to cope with the scope and pace of change generated by these factors.

The Changing Strategic Environment

The dissolution of the Warsaw Pact and the Soviet Union and the events surrounding the Gulf War have introduced a profoundly different strategic environment. In the maritime arena, this further complicates the already complex boundaries and jurisdictional situation arising from the United Nations 1982 Convention on the Law of the Sea.[36] Regional instability has either increased or, in the absence of Cold War tension, become more apparent. Without the constraints effectively imposed by the superpowers,

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[35] Government of Canada, *Project 2010 -- A Flight Plan for the Future*, Ottawa, Department of National Defence, 1985, and *The Loom of the Light -- Phase I*, Ottawa, Directorate of Military Strategy, Department of National Defence, 1990.

[36] Hu, op. cit.

long-standing or continuing regional disputes have flared up and there appears to be little likelihood of quick or easy solutions.

Such instability threatens Canada in a variety of ways. Trade is its lifeblood. If the economies of trading partners are placed in peril, trade patterns may be disrupted, thereby limiting markets and interfering with vital sources of supply. If trading partners cannot manufacture, ship or receive goods, or, by virtue of unstable economies, pay for them, the Canadian trading posture is endangered. It is therefore in Canada's advantage to enhance and ensure stability. At the same time, however, it is unlikely that there will be any unilateral requirement for the long-distance escort of merchant ships in any situation short of global war. In such an event, the pattern and nature of trans-oceanic trade would be profoundly changed.[37] It is more probable that forces would be committed to a coalition to ensure safe passage through constricted waters or areas of dispute as was the case in the Persian Gulf in the late 1980s.

The Former Soviet Navy

The former Soviet Navy presents the most challenging and uncertain threat. All indications are that it is still strong, modern and modernizing. While the Cold War may be over and the Conventional Forces in Europe (CFE) negotiations are resulting in substantial reductions in Soviet land forces, the Navy has not been affected to the same degree. It has, in fact, gained three motor rifle divisions, ostensibly for coastal defence. It has also continued a programme of fleet rationalization and modernization.[38] During the three years up to and including 1990 some three dozen submarines and four dozen surface combatants were scrapped -- all of them obsolete and many having been inactive for some period of time. Although this has reduced the overall fleet size, Soviet warship

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[37] Joel J. Sokolsky, *Defending Canada: U.S. -- Canadian Defence Policies*, New York, Priority Press Publications, 1989, p. 37.

[38] Rear Admiral Thomas A. Brooks, "The Soviet Navy in 1990: A U.S. View -- Still Cautious", *United States Naval Institute Proceedings Naval Review 1991*, May 1991, pp. 183-187. See also Captain William H.J. Manthorpe, "The Soviet Navy in 1990: The Soviet View -- Changing in 1990", *ibid*, pp. 187-190 and Captain Richard Sharpe, RN, ed. *Jane's Fighting Ships, 1990-91*, Coulsdon, Jane's Information Group, 1990, pp. 69, 71.

construction was at its highest in history in 1989 and 1990. In each year a record tonnage of submarines was built, exceeding construction since the early 1980s. Ten submarines and nine major surface combatants were built in 1990. The Navy is also in the middle of a programme to construct four aircraft carriers, each capable of carrying sixty aircraft. Scrapping of obsolete ships in concert with the building programme has produced a more modern and homogeneous fleet.

The situation has become particulary confused since the autumn of 1991. Reports in the Russian press indicate that the carrier programme may be suspended.[39] At the same time, Rear Admiral E. Sheafer, Director of US Naval Intelligence, noted "a lot of mixed signals"[40] including continued construction of the carriers despite statements to the contrary by the Ukrainian government. At the same time funding for the development of fixed wing carrier aircraft has apparently been suspended.[41] It is anticipated that construction programmes will be slowed and the overall naval operation reduced. The ballistic missile submarine force is expected to remain largely intact although construction appears to have stopped. Six nuclear attack submarines were launched in 1991 and some construction is continuing.[42]

Regional Navies

Concurrent modernization and expansion of regional navies has also taken place. This has been accomplished in many cases by nations becoming willing clients of the super powers in acquiring the latest in high quality ships and weapons systems. The possibility of more modern equipment becoming available as a result of the reductions

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[39] Richard Woff, "Soviets May Scrap Latest Carriers", *Jane's Defence Weekly*, 23 November 1991, p. 985. Woff quotes the Russian newspaper *Sovetskaya Rossiya*, indicating that the two latest carriers might not be completed and that the older helicopter carriers MOSKVA and LENINGRAD may be paid off next year.

[40] Quoted in Barbara Starr, "Soviet Navy May Avoid Breakup", *Jane's Defence Weekly*, 4 January 1992, p. 11.

[41] Barbara Starr, "No New Fighters for CIS Navy", *Jane's Defence Weekly*, 29 February 1992, p. 348.

[42] *ibid.*

by the superpowers increases the problem. A significant number of countries have also initiated or expanded indigenous development and building programmes, producing modern, capable fleets. These trends present two challenges -- first, the capability to interfere effectively in activities important to Canada and second, the capability to react successfully to any outside intervention.

Economic Challenges

Within its jurisdictional area, Canada faces the unusual situation of coping with non-military challenges, in part raised by its friends and allies. A growing demand for food, particularly fish, has put increased pressure on already delicate resources. The growth of the Canadian fleet and its substantially increased share of the total catch has been a major problem.[43] Overfishing for migratory fish stocks is devastating the industry and is currently beyond the jurisdiction and effective control of individual nations. Some foreign fishing, mostly by NATO partners, is authorized within the Exclusive Economic Zone, based on agreements arising from historic practices. This, nonetheless, is a source of growing irritation to Canadian fishermen. In the face of declining fish stocks, there will be a requirement for increased supervision and inspection.

Economic and political instability often interfere with the ability of states to provide the essentials of life to their people. In the attempt to find safety and a better life, emigration or flight to countries such as Canada is increasingly attractive. Existing mechanisms for the control of immigration are already challenged by a continuing flow of refugees and illegal immigrants and would be overwhelmed by a sudden increase. The arrival of 155 Tamil refugees off Newfoundland on 11 August 1986 and 174 Sikhs in Nova Scotia on 12 July 1987 and the resulting involvement of Maritime Command exemplify the potential problem.[44] Enforcement requirements of immigration and refugee policies can

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[43] See Appendix I for details.

[44] Mary Janigan, "Desperate Voyage", *Maclean's*, 25 August 1986, pp. 8-12; and Chris Wood, "The Newest Boat People", *Maclean's*, 27 July 1987, pp. 6-9.

be expected to grow, placing more responsibility on the Navy for surveillance and enforcement of immigration regulations.

The smuggling of narcotics for both the Canadian and American markets through the Maritimes and British Columbia will continue the demand for naval surveillance and assistance to the police. Considerable time and resources will have to be expended if the process is to be more successful than similar efforts in the same areas during Prohibition.

Boundaries and Jurisdiction

Jurisdictional problems are compounded by disputes over boundary delineation.[45] Some are historic in nature, but all have taken on a new significance with the extension of the 200 nautical mile limit. Canada and the United States have had past disagreements over the boundary in the Gulf of Maine and on George's Bank. Boundaries in the Beaufort Sea and Dixon Entrance continue to be in dispute. France and Canada are currently before the World Court concerning the delineation around the islands of St. Pierre and Miquelon.

The Canadian Arctic

Most discussion concerning threats to the Canadian maritime area deal with the Arctic. There has been no challenge to Canadian sovereignty over the Arctic land mass and islands for over 60 years. The Arctic waters are a different matter. The 1987 White Paper, *Challenge and Commitment*,[46] developed the concept of a three ocean strategy based on the potential use of the Arctic by a enemy "to get in close and attack targets of his own choosing". While the possibility of this eventuality may be diminished, the control of the area is still beyond the current capability of the Navy. With potentially expanded exploitation of the area's resources and concurrent commercial shipping activity, such control will be increasingly important.

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[45] Donald M. McRae, "Canada and the Delimitation of Maritime Boundaries" in McRae. *Canadian Oceans Policy*, op. cit., pp. 145-164.

[46] Government of Canada, *Challenge and Commitment*, Ottawa, Department of National Defence, 1987.

The key challenge to Canadian Arctic sovereignty is the reluctance of the United States to accept the classification of the Northwest Passage as Canadian internal waters.[47] This has considerably more to do with precedents affecting the United States Navy's global roles than with the desire to use Canadian Arctic waters regularly. The public perception of the issue is confused by a lack of discrimination among the Arctic Region as a whole, the Russian Arctic and the Canadian Arctic.[48] This is exemplified by reports of submarines surfacing at the North Pole, with the unstated and probably groundless implication that this involves the use of Canadian waters.

In dealing with all such challenges one should consider that most are of a nature to prompt a diplomatic or legal rather than a naval response. The use of the Navy must be predicated on its ability to resolve the situation under dispute successfully through its presence rather than the actual use of force. It must be recognized, however, as the potential final step in enforcing the national will.[49]

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[47] Donat Pharand, "Arctic Sovereignty: Does Canada Own the Northwest Passage?", *United States Naval Institute Proceedings*, July 1988, pp. 98-101. Pharand concludes that, based on the application of straight baselines, the Northwest Passage is legally an internal waterway. Nonetheless, he states that the failure to take adequate control measures could result in the Passage becoming an international strait, open to ships and submarines.

[48] Ronald G. Purver, "A Canadian Perspective on Security in the Arctic" in Stanislav J. Kirschbaum, ed. *La Coopération France -- Canada et la Sécurité Maritime*, Montréal, Editions du Méridien, 1991.

[49] James Cable, *Diplomacy at Sea*, Annapolis, Naval Institute Press, 1985. "...the velvet glove of diplomacy can neither grasp nor manipulate a dispute if there is no hand within it." p. 11.

IV CONSIDERATIONS IN FUTURE FLEET DESIGN

General

In his address to the Conference of Defence Associations on 23 January 1992, the Chief of the Defence Staff stressed three fundamental issues in discussing the future of the Canadian Forces. These were:

- Warfighting capability is paramount.
- The Canadian Forces cannot get more effective by getting smaller.
- In procurement it is important to get more rather than "less that is perfect".

In developing options for the future design of the Canadian fleet appropriate to its type and function, these issues and a number of other general factors must be considered.

Fiscal Limitations

Available funding is the overriding constraint in the consideration of optional force structures. The fiscal situation of the country, coupled with the readiness of both the Government and the public to regard National Defence as a low priority when faced with competing demands for funds, severely limits flexibility and innovation. This is the greatest challenge facing planners in National Defence Headquarters. It is also the one over which they have the least influence.

The defence budget has remained essentially constant at 2% of GDP and 8% of total federal expenditures since 1975.[50] During that period, the budget has grown steadily in constant year dollars. What has changed is the proportion of the defence budget allocated to personnel versus capital acquisition. The latter declined from 57.1% in 1953 to 7.8% in 1972, coinciding with a substantial increase in the inflation rate and the

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[50] Danford Middlemiss, "Canadian Defence Funding: Heading Towards Crisis?", *Canadian Defence Quarterly*, October 1991, pp. 13-20. It is noteworthy that the oft-decried low percentage of GDP contributed to defence represents a per capita contribution which ranks Canada sixth amongst NATO nations.

upward revision to the pay structure of the Armed Forces to bring it in line with that of the Public Service. While the proportion allocated to capital grew to over 25% in the mid-1980s, the cumulative effect of long term underfunding has resulted in broad areas of obsolescent equipment, making modernization of the existing Armed Forces nearly impossible within available resources.[51]

It is unrealistic to believe that, short of a major global emergency, the defence budget will increase substantially in constant dollars. In the face of other demands and distractions, the Government has neither the time, interest, nor will to address long term defence deficiencies. Meanwhile, internal budget allocations will almost certainly continue to be based on each element taking its turn for major equipment programmes. In the near term, the cost of the current naval building programme is the predominant budget feature. Future developments must acknowledge the substantial capital requirements facing, first, the Army and, subsequently, the Air Force.[52]

Foreign Policy

With the recent and on-going dramatic changes to world order challenging government policies everywhere, Canadian foreign policy has been re-examined. In two speeches in the autumn of 1990,[53] the Right Honourable Joe Clark, Secretary of State for External Affairs, described the basic themes of Canadian foreign policy and their linkage to Canadian security. The central issue is the change in the perception of security as a concept of competitiveness to one of cooperation. Because of its size, population and location, Canada has been more dependent than others on international order which it

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[51] *ibid*, p. 16.

[52] This was most evident in the exchange of letters between General A.J.G.D. de Chastelain and Vice Admiral C.M. Thomas when the latter resigned as Vice Chief of the Defence Staff in April 1991.

[53] Joe Clark, "Canada in the World: Foreign Policy in the New Era", op. cit. and "Peacekeeping and Canadian Foreign Policy", notes for a speech at the Annual Meeting of the Canadian Centre for Arms Control and Disarmament, Toronto, 8 November 1990.

can neither ignore nor impose unilaterally. At the same time Canadian values in foreign policy flow from a commitment to freedom and democracy.

Clark noted the growing problems confronting world order --the international drug trade, terrorism, the global environment, weapons proliferation, international debt and the persistence of regional conflicts. Faced with these problems, he stated that it is Canada's duty and obligation to continue to seek peace and defend order. In doing so there is a legitimate continuum from peacekeeping to peacemaking under the mandate of the United Nations. It is in keeping with this outward-looking policy that Canada committed forces to the Allied Coalition in the Persian Gulf.

The views enunciated by Clark were reiterated in a series of speeches in late 1991 by his successor, the Honourable Barbara McDougall.[54] She stated that the most important priority for Canadian foreign policy was to make the United Nations stronger, more effective, and more relevant to current challenges. Canada's policy of "constructive internationalism" would cover both military and non-military threats to global security. The solution of problems on a multilateral basis would provide the stable, peaceful world which would be in the best interests of Canada and the international community.

Relations with the United States

The historic relationship with the United States is of significance in developing future force structures and roles. Since the Ogdensburg Agreement in 1940,[55] it has been a basic premise of Canadian security policy that, by providing for its territorial defence,

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[54] Barbara McDougall, "Notes for a Statement by the Secretary of State for External Affairs, The Honourable Barbara McDougall, to the Forty-sixth Session of the United Nations General Assembly, New York, 25 September 1991, "Notes for a Speech by the Honourable Barbara McDougall, Secretary of State for External Affairs, to the Association for Canadian Studies in the United States", Boston, 21 November 1991, and "Notes for a Speech by the Honourable Barbara McDougall, Secretary of State for External Affairs, to the Conference Commemorating the 60th Anniversary of the Statute of Westminster", Toronto, 10 December 1991.

[55] James Eayrs, *In Defence of Canada: Appeasement and Rearmament*, Toronto, University of Toronto Press, 1967, p. 183. In Kingston in 1938 Roosevelt had publicly guaranteed the support of the United States should Canada be threatened. King replied, pledging the defence of Canada and its denial as an avenue of invasion of the United States.

Canada would also provide for the defence of the northern border of the US against any third party aggressor. This has led to participation in NORAD and the Canada/US defence agreements with a high level of cooperation and mutual respect between the armed forces of the two countries. Realistically, there has been no alternative which is either fiscally or diplomatically responsible.

Defence Policy and Alliance Relationships

The new defence policy[56] is more inward-looking than Canadian foreign policy, placing greater emphasis on territorial defence and nationally oriented operations. The continuing requirement for international commitments is acknowledged, albeit with reduced forces and at a lower priority. From a naval perspective there is a desire for more flexible forces, rather than those dedicated to the protection of sea lines of communication in support of NATO. Nonetheless, the future concentration on activities in territorial waters, with the proposed concurrent changes in fleet configuration, does not fully acknowledge or utilize the inherent flexibility of naval forces in exercising a wide variety of military and diplomatic functions.

Canada does not have nor does it seek the capability to act unilaterally in any major military undertaking. The combination of enormous territory and small forces has made alliance participation an essential element of Canadian defence and foreign policy. As noted above, Canada's security depends not only on being safe from direct attack but also, and perhaps more importantly, on the preservation of world order and stability, and the reduction or elimination of conflicts which threaten them. This can best be done by both military and diplomatic means under the auspices of the United Nations, NATO or other similar multinational coalitions of like-minded nations, and in a bilateral alliance based on the geographic reality of the relationship with the United States.

The status of the various alliances to which Canada belongs is changing in response to the shifting strategic situation. In particular, NATO is undergoing a serious review,

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[56] *Minister's Policy Statement*, op. cit.

involving both a revised strategic concept[57] and new military structures. Through this period of strategic turbulence Canada has reaffirmed its commitment to cooperative security through the United Nations and NATO, the latter by subscribing to both the London Declaration and the Rome Declaration.[58] The Prime Minister, in his convocation address to Stanford University,[59] described the North Atlantic Treaty as "an indispensable insurance policy against a return to the autarchy of the Thirties" and described NATO and CSCE as fundamental to providing member nations with a vital sense of security.

A Seat at the Table

Canada has placed considerable emphasis on the diplomatic utility of the Armed Forces in ensuring a "seat at the table".[60] With the military restructuring underway within NATO, the delicate task of determining the appropriate level of contribution remains a challenge. As John Halstead notes, there is a strong temptation to do only the minimum necessary. The influence of the WEU, EC and CSCE on European security issues, in concert with Canada's own shift towards a more nationally oriented defence policy, will probably change the focus of Canadian defence efforts increasingly towards those of the United States.[61] Nonetheless, it must not be forgotten that it is NATO alone that provides

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[57] NATO, *The Alliance's Strategic Concept*, Brussels, NATO Office of Information and Press, 1991.

[58] NATO, *London Declaration on a Transformed North Atlantic Alliance*, issued by the Heads of State and Government at the meeting of the North Atlantic Council, London, 5-6 July 1990 and NATO, *Rome Declaration on Peace and Cooperation*, issued by the Heads of State and Government participating in the Meeting of the North Atlantic Council, Rome, 7-8 November 1991.

[59] Brian Mulroney, *Notes for an Address by Prime Minister Brian Mulroney in the Occasion of the Centennial Anniversary Convocation Stanford University*, 29 September 1991.

[60] Joel J. Sokolsky, "A Seat at the Table: Canada and Its Alliances", *Armed Forces and Society*, Fall 1989, pp. 11-35. See also J.G.H. Halstead, "A Defence Policy for Canada: The White Paper Two Years On", *Behind The Headlines*, Winter 1989-1990, pp. 1-16.

[61] Allen Sens, "Canada, NATO, and the Widening Atlantic: Canadian Defence Policy into the 1990s", *Canadian Defence Quarterly*, February 1991, pp. 11-16. See also Colonel James H. Allan, "Canadian Defence Policy After the Gulf", *Canadian Defence Quarterly*, October 1991, pp. 21-24. Allan calls for an integrated, rationalized defence policy with the United States, drawing a comparison with the Free Trade Agreement.

for common defence in the Atlantic community and that it is membership in NATO which permits Canada to participate in the defence aspects of European security.[62]

The planned withdrawal of all stationed forces from Europe by 1993 and the closure of Lahr and Baden by 1994 has the potential to weaken Canada's influence. At the same time however, dramatic cuts, nationally and internationally, are being made in all Alliance land and air forces. The military and diplomatic importance of the continuing Canadian naval contribution to NATO, particularly with the addition of the new frigates, may offset the reductions in other areas and be greater in proportion than the size of the fleet itself.

Canadian Naval Capability Requirements

The general capability requirements of the Canadian Forces were defined in the Defence Policy statement[63] in terms of retaining:

- The means for controlling all movements within Canadian territory, airspace, territorial waters and in the areas adjacent to them.
- The command, control and communications systems required to carry out national missions and those undertaken as part of the (NATO) Alliance.
- The naval, land and air forces required to accomplish any mission deemed appropriate by the Government.

These represent the policing, military and diplomatic functions. This general mandate could provide a broad range of options, if not constrained by fiscal responsibility, the reality of the existing fleet and infrastructure, and current procurement contracts.

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[62] Paul Buteux, "Canadian Defence Policy: European and East-West Dimensions", *Canadian Defence Quarterly*, August 1991, pp. 24-30.

[63] *Minister's Policy Statement*, op. cit. p. 7.

The potential range of roles and scope of operations which face the Canadian Navy require it to have the capabilities of a contiguous sea or regional force projection navy. It must be able to operate in and to seaward of the Exclusive Economic Zone in defence of national interests. It must also have some capability to operate beyond the contiguous seas, in most cases within an alliance or under the protection of the United States.

Commitment versus Capability

The degree of influence the Government wishes to have or exert over national or international events will largely dictate the range and scope of future roles. The current fleet has too few operational vessels and too few maritime patrol aircraft to provide complete, in-depth coverage of Canadian territorial waters and the EEZ or fully meet all existing and potential international commitments.[64] With the configuration and limited size of the projected fleet, moreover, the gap between commitments and the capability to respond to them will persist. This can only be corrected through increases in fleet size, changes in configuration or by the increased application of technology as force multipliers. Each option comes with a big price tag. The alternative is the rationalization of the fleet or elimination of one or more roles.

By 1996 the planned Navy will be newer and more modern than at any time since World War II but will be smaller in the number of major units and logistics support ships. It will thus have less institutional flexibility, regardless of the capability of the individual ships. It is in the choice of the proposed new equipment and selection of roles that the focus can be changed.

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[64] *Challenge and Commitment*, op. cit. p. 43.

High level units may perform lower order tasks. The reverse is not possible.[65] The proposed corvettes exemplify this. They will not satisfy requirements unless they turn out to be light frigates, in which case they may be unaffordable.

In uncertain times the nature of the response to a crisis and its timeliness may be critical. The capacity to move to higher order tasks effectively and quickly must be a fundamental principle of fleet structure and training. This demands sufficient numbers of ships and a flexible fleet.

The Rationale for Roles and Tasks

Creation of a future fleet model requires definition of the rationale for all roles and tasks for the Canadian Navy. These must specify those which are uniquely Canadian and must or might be done by the Navy alone and those which might be addressed within a multilateral perspective. Should Canada participate in large-scale hostilities, (representing the "worst case" scenario), it could only do so in conjunction with other like-minded nations as was the case in the Gulf War. Alliance or coalition strategy would be in effect. The tasks assigned to Canada by the alliance leadership would be conditioned by the alliance operational requirements and the nature of Canada's contribution. These would be determined through consultation with Canadian political and military authorities. The configuration of the Canadian fleet and the availability of its ships would thus dictate the nature of the contribution to the alliance and the roles assigned. While the alliance may require a balanced fleet, there is nothing which demands that all participants contribute equally to all functions.

While the highest level of command and broadest range of responsibility may be desired and planned for, nothing demands that Canada take on any specific roles within an alliance. Experience has clearly demonstrated that alliances have a wide range of requirements enabling them to accept any potentially useful contribution. The contribution

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[65] Lieutenant Commander Christopher A. Abel, "Of Sirens' Songs and Sailors", *United States Naval Institute Proceedings*, March 1991, pp. 79-82.

of specialized forces such as minesweepers or anti-submarine escorts by themselves are valuable and welcome additions to a coalition fleet.

There is, nonetheless, a real challenge in developing a coherent fleet capability. On the one hand, nationally oriented requirements demand a fleet capable of comprehensive surveillance and local sea control, in which extensive warfighting capability is not essential. On the other hand, contributions to world order and stability require a navy with blue-water, global reach and the ability to counter and defeat adversaries equipped with the most sophisticated weapons. Naval requirements for each role are radically different and present their own challenges. The envisioned nationally oriented roles need more hulls but not necessarily more advanced technology. Collective security commitments require high tech ships capable of operating in a high multi-threat environment which, by cost alone, tend to reduce overall fleet size and flexibility.

The Question of the Balanced Fleet

Given budgetary constraints the Navy cannot achieve a fully capable balanced fleet of adequate size; that is, it cannot maintain a core capability in all areas of naval operations. Escalating costs have forced a steady decline in overall force size. In the attempt to maintain a balanced fleet, the result has been "penny-packets" of capability which, individually and collectively, fail to diminish the commitment-capability gap. Further, limited production runs and varying ship types and designs have failed to develop economies of scale.

The fleet structure, in addition to coping with all peacetime tasks, must also allow a smooth and timely transition to war, ensuring successful prosecution from the earliest stages. The argument for a balanced national fleet presumes a requirement for unilateral operations with either sufficient forces to deal with the emerging crisis or sufficient time to expand to the required level.

Time is a critical consideration -- how much time will be available to respond and how long will it take to develop the response? In any other than a short or limited war,

it may be possible to build second level units and support infrastructure but even in a protracted conflict it would be next to impossible to produce major warships in sufficient time to affect the outcome.[66]

Industrial Support

The inability of the Department of National Defence to conduct concurrent major capital programmes of the magnitude of ship replacement, air fleet replacement or armoured fighting vehicle acquisition has a major impact on the Navy. Unlike the other services, the Navy has built virtually all its fleet in Canada and needs a healthy shipbuilding industry. The result of the long intervals between programmes, however, has been a 'boom or bust' cycle for the shipyards, which rely increasingly on government orders. New procurement programmes become increasingly expensive and challenging as the number of major building yards, the experience level and availability of skilled workers decline in the intervening years.[67] If Canada is to continue build her own warships it will be necessary to establish a programme of continuing construction which will allow for the preservation of the shipbuilding capability, regular modernization and continuity in fleet design.[68]

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[66] TRIBAL class destroyers in World War II were ordered from Canadian yards in June 1941. The first was delivered in September 1945. See J.H.W. Knox, "An Engineer's Outline of RCN History: Part I", pp. 96-116, in James A. Boutilier, ed. *RCN in Retrospect -- 1910-1968*, Vancouver, The University of British Columbia Press, 1982. Unless orders were part of an ongoing building programme it is unlikely that such a lead time could be significantly reduced.

[67] See Appendix I for additional details. See also Cdr. J.Y. Clarke, "Canada's Shipyards -- Yesterday, Today and -- Will there be a Tomorrow?", *Maritime Affairs Bulletin No. 1/88*, pp. 1-4, and Canadian Maritime Industries Association, "The Canadian Shipbuilding and Ship Repair Industry -- Framework for a National Policy", *Maritime Affairs Bulletin No. 3/88*, pp. 7-9.

[68] For example, to maintain a 20 ship fleet with an individual lifespan of 30 years, a new ship should be produced every eighteen months. At roughly ten year intervals (after six or seven had been built), an update of the ship design and associated systems would precede the next batch. In parallel, the ships from batch one would be modernized in operational mid-life refits. At about twenty years, a final refit would concentrate on maintaining seaworthiness, with the last stage of the ship's life being focussed on low intensity, nationally oriented roles. Such a process would sustain both the fleet and its supporting industry.

Operational Training

It is essential that the Canadian Navy have, or have access to, the resources necessary to conduct a comprehensive operational training programme in order to be capable of carrying out all assigned tasks. Such training must be done at four levels:

- Single ship training, encompassing individual personnel, ship's teams and the ship's company as a whole.
- Formation training, where two or more ships practice the full range of naval activities.
- Joint training with the Air Force and/or the Army.
- Combined training with components of the armed forces of other countries.

Insofar as is possible, the Navy has relied on its own resources for training. Where facilities have not been available, Allies have routinely assisted by loaning equipment or providing access to facilities. While not always satisfactory, minimal requirements have been met.

Total Force and the Navy

The personnel structure of the Canadian Forces is being developed as a Total Force, integrating Regulars and Reserves, as well as men and women. Career patterns are evolving and the concept of twenty or more years of continuous, full-time service may no longer be the norm. Given the variations in training, experience and availability for service at short notice, this will impact on the structure and responsiveness of the Navy. Employment and training must relate to the types of ships and equipment and must be adapted to the amount of time personnel can devote to service requirements.

Total training costs must also be considered. As the variety of ships and systems increases, the number, variety and cost of courses needed to support them grows dramatically. Any rationalization of the fleet structure can therefore reduce training costs.

National Operations, Sovereignty and Surveillance

Sovereignty has been the focus of much discussion dealing with national operations. The unstated but clear implication is that its establishment and protection is entirely the responsibility of the military. In fact, sovereignty is demonstrated and protected by effective occupation and the appropriate exercise of all forms of national jurisdiction, including federal and provincial licensing, police, courts and government services. The existence of a competent military force signals a government's determination to protect the nation's sovereignty, but its use appropriately represents only the final step when all other elements have proven inadequate.

From a national operations perspective, the first priority is the requirement to know what is going on in the areas of interest to Canada, including Canadian territory, waters and approaches. Surveillance resources must be capable of detecting all objects or activities which might pose a threat to Canadian interests. These include missiles and hostile aircraft, warships and submarines, drug smugglers, illegal fishing vessels, polluters, etc. Canada relies on national and international military and police intelligence sources, NORAD, national aerospace and maritime operations and a variety of related operations involving other government departments for this function.

Depending on the nature of the threat and the potential for unwelcome activities in and around Canada, the surveillance requirements may be further defined.[69] Military threats require rapid detection, evaluation and subsequent response. This entails constant coverage either from sea, land, air or space-based radars. The use of space-based radars would require a large number of satellites to achieve satisfactory coverage against such targets. Slower targets may well be detected by fewer satellites with a variety of relatively short re-visit times. Alternatively, aircraft, ships or land-based radar may be acceptable for stationary targets, pollution or ice surveillance.

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[69] See George Lindsey and Gordon Sharpe, *Surveillance Over Canada -- Working Paper 31*, Ottawa, Canadian Institute for International Peace and Security, 1990 for a detailed discussion of surveillance requirements and systems capabilities. The explanation of satellite capabilities is particularly useful. See also George Lindsey "Space Surveillance and Canada", *Canadian Defence Quarterly*, October 1991, pp. 7-12.

Given the size of the Exclusive Economic Zone, the location of existing bases, the response time to reach distant areas and the potential speed of intruders, it is essential that surveillance coverage extend well beyond the limits of direct jurisdiction. As coverage in these areas is of common interest to both Canada and the United States, it would be appropriate to develop a joint regime serving both nations.[70]

Surveillance satellites are expensive and are probably unaffordable for the Canadian Forces alone. With agreed specifications and common requirements, including shared information, jointly-funded satellites could satisfy the requirements for interested governments, departments and agencies.

Aircraft can provide a high coverage rate in critical areas, broad general coverage and rapid response. To provide continuous coverage for any length of time, however, requires a large fleet of aircraft. It was universally agreed in 1983 that 36 long range maritime parol aircraft were required, in addition to 18 coastal patrol aircraft.[71] Of particular value, in addition to increasing the AURORA fleet, therefore, would be a rationalization of the surveillance requirements of the many government departments and agencies currently conducting their own operations.[72] The conversion of CHALLENGERs to coastal patrol aircraft and the acquisition of additional light turboprop aircraft will improve the overall capability in concert with the ARCTURUS aircraft, permitting the AURORAs to concentrate on the more complex ASW role.

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[70] Commander Peter Haydon, "The Future of the Canadian Navy", *Canadian Defence Quarterly*, December 1990, pp. 7-16.

[71] Government of Canada, *Canada's Maritime Defence -- Report of the Sub-committee on National Defence of the Standing Senate Committee on Foreign Affairs*, Ottawa, 1983, pp. 43, 57.

[72] Nicholas Swales, "Coastal Aerial Surveillance: Who's Job?", *Forum*, September 1990, pp. 14-16. Swales argues that economy and efficiency should dictate that DND take over all coastal surveillance, noting that the RCMP, Environment Canada and DFO either do not want to operate aircraft or lack the resources to operate them. The flexibility of the Canadian Forces in operations makes them a better candidate than the Coast Guard.

Subsurface surveillance is currently conducted using passive fixed systems, aircraft, surface ships and submarines. This requirement will persist as long as the threat posed by the current CIS submarine capability exists. In some form it will continue to be required to ensure control under territorial waters. The planned installation of fixed sensors in key passages of the Arctic archipelago will enhance this capability[73] -- additional nationally controlled systems may be desirable on both coasts.

The least efficient means of conducting unalerted surveillance over a large area is by ship or submarine. The coverage areas and rates are too low. Deployment to patrol areas is too slow as is the movement to alternate areas. This limitation is partially alleviated by the use of ship-borne helicopters or towed array sonars. On-site endurance is a positive attribute, however, where there is a requirement for localized continuity of observation.

The development of surveillance capability must also recognize the requirement for the Navy to deploy unilaterally or in support of alliances and coalitions on a potentially global scale. The capability should permit its use, where possible, in support of deployed units and formations and, equally important, be compatible with the systems used by allies. Should this not be the case, the Navy will be either of limited utility or totally dependent on others in any form of combined operations.

The national requirement for interpretation, processing and dissemination of information obtained from surveillance will continue to challenge the Canadian Forces. This is particularly true if the information is obtained from allied military sources on a privileged basis, yet should be shared with other government departments. Allied constraints may preclude such sharing. The dilemma is the full access to information through nationally owned and operated systems, versus the cost benefit of shared intelligence from allies. Its solution would promote efficiency and responsiveness, eliminate duplication of effort and permit consolidation of activities.

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[73] Ann MacInnis, "Sovereignty Through Sonar", *Wings Newsmagazine 1991/92*, pp. 48-49.

Responsiveness

Having gained some indication of unknown or undesirable activity within or approaching Canadian areas of interest, the appropriate response must be timely, flexible, at the appropriate level of force, and clearly demonstrate national will and resolve. The ultimate goal is the achievement of a capability to exercise sea denial throughout Canadian waters and sea control in limited areas as required for national activities.

Timeliness of response is fundamental to any operation. In many cases, this may best be done through the use of maritime air resources to localize, positively identify and track the object of concern. Should interception be necessary for the purposes of inspection or arrest, surface vessels can provide that capability.

Flexibility and appropriate levels of force spring from the same combination of air and surface forces. Ships can monitor activities, manoeuvre so as to influence other vessels, fire warning shots, board or, in the final analysis, attack. Properly equipped aircraft can carry out all but the boarding function.

National will or resolve is best demonstrated if the actions taken are as advertised to potential adversaries or violators of national or international law. If Canada says what it will do, and does what it said it would, the effective enforcement of national wishes will be enhanced. In many cases, the mere presence of ships or aircraft capable of forceful action will act to deter intruders or violators.

Aid to the Civil Power / Assistance to Civil Authority

At the low intensity end of national operations, increased emphasis on military participation in Aid to the Civil Power, Assistance to Civil Authority and other para-military roles has broad public support. The Department of National Defence, in

keeping with the provisions of the National Defence Act, has established guidelines for participation in such activities,[74] including the following conditions:

- It must be in the public interest and consistent with the purposes of government policy.
- It must not result in an unacceptable degradation of the Forces' ability to carry out defence activities.
- It must not adversely affect the confidence or respect the public has for the Canadian Forces as a fighting force.
- It must not compete with or duplicate similar activities in the civil sector.
- It should not be on a continuing basis.

The Navy has carried out a wide range of these functions including search and rescue, fisheries patrols, assistance to law enforcement agencies and pollution control. Many are on a continuing basis, largely because no other agency possesses the capability. In particular, its command and control capability is most valuable in assisting civilian agencies and other government departments. It is well suited to continue such operations and take on new assignments in the future.

International Operations

Canada, both by design and necessity, is a relatively small player within the various alliances and coalitions to which it has chosen to belong. Government policy has dictated the size and nature of contributions to NATO which, as noted above, have led to the development of an ASW escort navy since World War II. The resulting fleet structure was also ideally suited to defence of North America in conjunction with the United States Navy. In more recent years limited force size, aging equipment and modest alliance contributions have, in turn, restricted the range of roles the Canadian Forces have been capable of fulfilling.

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[74] Kenneth J. Calder and Francis Furtado, "Canadian Defence Policy in the 1990s: International and Domestic Determinants", *Canadian Defence Quarterly*, August 1991, pp. 9-13.

The 1991 defence policy calls for enhanced versatility and flexibility of maritime equipment rather than concentrating on a fleet designed for protection of the sea lines of communication between Canada and Europe. At the same time, however, there is no implication that a concurrent reduction in the capability to carry out that role is either desired or appropriate. Collective defence arrangements will be maintained including NATO, continental defence agreements with the United States and support to the United Nations as dictated by Canadian diplomatic requirements.

The range of potential activities in international operations requires great flexibility in the ordered application of force. Units must have the capability to carry out tasks which vary from surveillance to combat. Units and formations must be essentially self-sustained, both for logistics and command and control.

In a more uncertain strategic climate, specific alliance roles and requirements will take on less importance in fleet design. It is now more appropriate to view alliance contributions from the perspective of what Canada can offer from the fleet it must have to satisfy national requirements. With a fleet designed for broader roles with a general purpose capability, this flexibility may, in fact, enhance any potential contribution to an alliance.

Strategic Reach and Sustainment

A fundamental determinant in international operations is that of reach.[75] The new defence policy increases the emphasis on global operations, but changes the parameters. The majority of extended foreign operations carried out by Canada, most notably in the Persian Gulf, have been supported by air transport operations through Lahr, Germany. The lack of an intermediate airhead in Europe after Lahr's closure in 1994, coupled with potential problems over availability of bases, repair facilities, suitable

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[75] Hill, *Maritime Strategy for Medium Powers*, op. cit. pp. 149-156. See also Cable, *Navies in Violent Peace*, op. cit. p. 103. Hill defines reach as the distance from home bases at which operations can be carried out. Relevant considerations include the limits of the nation's vital interests, the type and level of operations and sustainability. Cable also draws attention to the requirement for sufficient fleet size to permit the absence of deployed units from home waters.

harbours and airheads in or close to a theatre of operations will significantly complicate future operations.

The planned disposal of HMCS PROVIDER without replacement will also inhibit international operations, leaving only one operational support ship on each coast. While this may be partially compensated for by careful planning of refits and exercises, "you can't plan other people's wars".[76] At the same time, the overall reduction in the number of blue-water capable ships in the fleet will be a constraint as events near home may preclude sending and sustaining a force of any significance abroad. If Canada is serious about being responsive to international crises, these limitations must be considered.

Operations and Training with Foreign Navies

Planning for global deployments must take into consideration the requirement to operate with unfamiliar forces which have incompatible equipment and different concepts of operations. The Canadian Navy is broadly experienced in international operations. It has participated on an almost uninterrupted basis in the Standing Naval Force Atlantic since its inception in March 1968, providing command of the Force five times. It has trained and exercised with other navies world-wide, developing broad expertise and acquiring a sound reputation for professionalism. Should operations involve navies with which Canada has not previously worked, this broad experience should be of value. Nonetheless, the requirement for combined training may delay the immediacy of response in a crisis.

More important, as described earlier, is the threat posed by the emerging navies throughout the world. Their number has almost tripled since the First World War. Since the United Nations Conference on the Law of the Sea in 1982, the various claims of

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[76] Peter Haydon, quoted in "Navy's New Shape-up Program May Make it Tricky to Ship Out", *The Financial Post -- Defence Special Report*, October 21 1991, p. 40.

Exclusive Economic Zones have encompassed 32% of the world's oceans.[77] The new navies created to protect these areas often have modern weapons systems (some as good or better than those of the Canadian Navy). Planning for distant operations must take this into account must also reflect the unique challenges of the operating environment.[78] Shallow waters, lack of room to manoeuvre, sensor degradation and immediacy of the air threat all challenge operations. The use of mines, shore-based missiles and air forces give considerable advantage to defensive forces.

Force Projection

A related question is that of force projection[79] and the deployment requirements of the army brigade group designated for potential global roles. Now, and for the foreseeable future, such a deployment could only be done as an administrative move to a location with adequate port and airfield facilities and where there would be no opposition to disembarking. Sealift would have to be chartered. The Canadian Navy has no such capability and none is forecast. As noted in Appendix I, there are few Canadian-flagged merchant vessels appropriate to the requirement and most of them are not readily available for charter. The Canadian Forces airlift capability is essentially limited to personnel, minimal equipment for lead elements and modest sustainment.

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[77] Harold J. Kearsley, "The Small Navy's Role", *NAVY International*, October 1988, pp. 466-468. See also P.G. Pugh, "The Economics of Third World Navies", *Naval Forces*, November 1988, pp. 16-23. While both describe the challenges to small countries of developing a navy and the fallacy of adopting scaled-down versions of super power policies, they also highlight the increasing capability of these navies in a sea denial role. As Kearsley notes, the smaller state's defence against a threat by a major naval power rests on the ability to raise the potential price of operations beyond an acceptable level for the aggressor through the use of sy.. blic high tech armaments.

[78] Milan N. Vego, *Operation of Blue-Water Navies in Narrow Seas*, speech to Conference on Maritime Interests, Conflict, and the Law of the Sea, Halifax, 20-23 June 1991.

[79] Terry Liston, "Canada's New Defence Policy and 'Force Projection'", *National Network News*, 15 October 1991. Liston reviews the transport problems inherent in contingency planning, with emphasis on the lift problems of the Army and its requirement for heavy equipment in order to field a viable combat force. He decries the apparent unwillingness of planners to consider commercial transport, calling for legislation to encourage Canadian ship owners to support military operations .

Considerable debate about sealift and force projection followed Exercise BRAVE LION in 1986, when four large RO/RO vessels and nine Air Canada charters were used to transport 2150 vehicles, 5200 personnel and 15,000 tons of stores to Norway for the Canadian Air-Sea Transportable Brigade Group at a cost of $11.3 million. The exercise demonstrated that shipping availability would be the major limiting factor in deployment time and that it was unrealistic for Canada to expect to mount a rapid deployment force.[80] The ultimate result was the cancellation of the North Norway commitment the following year.

The debate was revived during the Gulf War when consideration was given to deploying a Canadian brigade group to the Middle East. For the deployment of their forces, the Americans drew on the resources of the Military Sealift Command and the Ready Reserve Fleet's 17 RO/RO vessels. In the initial phase they also chartered 173 commercial ships, 49 of which were foreign-flagged (including one Canadian!).[81] The British had a similar experience, chartering 110 vessels, 105 of which were foreign-flagged.[82] While there has been some public agonizing over the issue, the fact of the matter is that the market system worked. Ships were available, charter costs did not escalate unduly, and the rising insurance costs were part of the contracts.

The unexpressed concern appears to be over the urgency for deployment of national forces. It is unlikely that this would be done as a unilateral Canadian operation but, if it was, it is clear that chartering would work. If the planned deployment were to be part of a combined operation, lift resources would be sought in the same market. If there was competition for the same resources it is logical to assume that the alliance leadership would assign priority to forces for transport -- for example, an armoured

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[80] Lieutenant-Colonel G.D. Hunt, "Reinforcing the NATO North Flank: The Canadian Experience", *Canadian Defence Quarterly*, April 1987, pp. 31-38.

[81] Captain Douglas M. Norton, "Sealift: Keystone of Support", *United States Naval Institute Proceedings -- Naval Review*, May 1991, pp. 42-49.

[82] Robert O'Connor, "Sealift Shortfall During Gulf Crisis Sent UK Scrambling for Transport", *Armed Forces Journal International*, October 1991, pp. 38-40.

brigade might take priority over a mobile laundry and bath unit. Considering that deployment to Europe is one of the possible contingencies, SACEUR would assign transport priorities. This is a national command problem to resolve, rather than a naval one. The naval involvement would be unlikely to go beyond safe escort, where necessary, in the transit to the theatre of operations.

Canadian naval operations in a global context must have a clear goal. It is significant to note the observations on Operation DESERT STORM of Admiral Kelso, the American Chief of Naval Operations, who said that "sustainable combat capabilities and control of the sea provided by those naval forces afforded protection for the introduction of ground and air forces ...."[83] The Gulf War did not provide all the answers, but the range of challenges was apparent. Achieving sea control in a hostile environment far from national support requires a naval force which is self-sustaining and which can operate effectively in a multi-threat environment. The Gulf War at sea would have been a very different thing in the presence of submarines and aggressive, missile-equipped ships and aircraft. Unless the Navy is prepared for such a threat, it has no business venturing or planning to venture into the arena.

National Command and Control

National command and control of assigned forces has been fundamental to Canadian participation in combined operations. Such a requirement can only be meaningful if the contribution is of appropriate size. Anything smaller than the task group sent to the Gulf will preclude Canadian units acting as a national force under Canadian command and control. At the same time, the provision of no more than token contributions will reduce Canadian influence on alliance policy and may preclude having input to strategic and operational planning.

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[83] Quoted in G. Jacobs, "Operation DESERT STORM -- Coalition Warfare & Lessons Learned", *NAVY International*, October 1991, pp. 344-348.

The Self-image of the Navy

A natural by-product of the broad international experience, high level of training and professionalism within the Navy has been the strong desire of all personnel to be highly regarded by their peers in allied navies and to be seen as fully capable of operating on an equal basis with the best of them in all circumstances. This desire is enhanced by the belief that they will not be accorded the international respect and benefits of a full partner if they cannot do so.

Public Perceptions

Public perceptions play no small part in the self-image of the Navy. With the end of the Cold War and no realistic direct threat to Canadian territory, the requirement for continuing or increased expenditure on the Armed Forces has been questioned.[84] At the outset of the Gulf Crisis public reaction to sending a naval task group was mixed, negatively influenced by repeated media observations on the age of the ships and their perceived obsolescence.[85] Support for the Canadian role in the Gulf grew in the latter stages of the war, but it was only after the conclusion of the events that it was acknowledged that the Navy had carried out all assigned tasks well, demonstrating the importance of training and professionalism. At the same time there remains public sentiment that more should have been done, that Canada had been relegated to secondary tasks, and that this reflected badly on the country. It was clear, however, that a wider variety of roles could have been undertaken had the new frigates or the modernized TRIBAL class destroyers been available.

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[84] Michael Driedger and Don Munton, "Security, Arms Control and Defence: Public Attitudes in Canada, *The 1989 CIIPS Public Opinion Survey*, Ottawa, Canadian Institute for International Peace and Security, 1989 and Don Munton, "Security, Arms Control and Defence: Public Attitudes in Canada, *The 1990 CIIPS Public Opinion Survey*, Ottawa, Canadian Institute for International Peace and Security, 1990. The surveys showed an even split over defence spending. The 1990 survey showed virtually unanimous support for Canada's oceans and their resources. At the same time, the 1989 budget cuts were supported and there was little support for increases in defence capability if higher taxes would be required to pay for it.

[85] Examples include Paul Koring, "Ready and Set For a Replay of the Second World War", *Globe and Mail*, 15 October 1990, "Fighting Words", *Ottawa Sun*, editorial, 26 October 1990 and Robert Mason Lee, "More Sad Than Embarrassing: Canada's Shameful Role in the Gulf", *Ottawa Citizen*, 24 February 1991.

The limited public sympathy and understanding of the Navy has many roots. The Canadian public sees and knows very little of its Navy -- only a minuscule part of the population routinely sees warships. Most operations and training take place far from public observation and are not inherently newsworthy. The importance of the sea and its resources are not widely understood and the current problems of the Atlantic fishery, for example, create an appearance of declining value to Canada. Government and public preoccupation with constitutional and economic matters is also significant.

Given these various considerations, what options are available to naval planners?

V OPTIONAL STRUCTURES FOR THE CANADIAN FLEET

General

The functional capabilities expected from the Navy can be provided by various fleet configurations. In this chapter, options will be presented appropriate to the global and national strategic situation. All are broadly defined and no attempt has been made to provide detailed analysis or comparison of the enormous range of ships, aircraft and systems which could be considered for a fleet.

Four options have been developed, all of which conform to the general definitions of a contiguous sea or regional force projection navy (see Chapter V). Each has been based on the variety of considerations discussed in Chapter IV. They represent the type of navy foreseen in the 1991 defence policy, one more nationally configured, one more internationally configured and a fourth representing the possible impact of greater budgetary constraints.

In considering options for the Canadian Navy it is not possible to start with a clean sheet of paper. Much of the future Navy's fleet, infrastructure and supporting maritime air fleet described in the Minister's policy statement is already in existence or contracted for. The room for consideration of alternatives exists only on the margins of this fleet structure. Disposal of increasingly obsolescent units and the acquisition of new or different ships, aircraft and equipment appropriate to the future roles and tasks assigned to the Navy may be accelerated . Alternatives to the proposals contained in the policy statement, however, must be considered in advance of final procurement decisions. The realistic time frame in which choices can be properly exercised is between 1996 and 2005. By the start of that period, most of the contracted equipment will have been acquired or be in the process of delivery and most of the planned disposals will have been carried out.

The 1996 Fleet

By the end of 1996, all the City class frigates will have been delivered to the Navy. The initial maritime coastal defence vessels (MCDVs) will have joined the fleet and the coastal patrol aircraft programme will be in the middle of implementation. The acquisition and installation of fixed acoustic sensors in Arctic waters will be under way. All the improved ST LAURENT, RESTIGOUCHE and MACKENZIE class destroyer-escorts will have been disposed of. The destroyers ANNAPOLIS and NIPIGON and the support ship PROVIDER will be at or near the end of their operational lives, as will the three OBERON class submarines. It is anticipated that the mine countermeasure auxiliary vessels MORSEBY and ANTICOSTI will be disposed of as the first of the MCDVs are delivered. The SEA KING helicopter fleet will be approaching the end of its operational life and delivery of its replacement will follow with a projected in-service date of 2000.

The fleet and associated air resources on which Maritime Command will base its future operations will thus consist of:

- 4 x TRIBAL class destroyers
- 12 x CITY class frigates
- 2 x operational support ships (AOR)
- 3 x maritime coastal defence vessels (a further 9 will be delivered by 1998)
- 1 x diving support vessel
- 18 x AURORA maritime patrol aircraft
- 3 x ARCTURUS surveillance aircraft
- 3-6 x CHALLENGERS configured as coastal patrol aircraft (up to 6 light turbo-prop aircraft will be acquired by 2003)
- 35 x shipborne helicopters (delivery is planned to be completed by the end of the century)

This structure will be the core of any future variations which may be considered. The majority of the ships and the helicopters will be new and current in their design. At the same time, it must be remembered that in 1996 the TRIBAL class destroyers,

although modernized, will be 25 years old, as will be the operational support ships. The AURORA fleet will be approaching 20. Options for replacement of the ships and a possible update for the maritime patrol aircraft must be considered before the end of the period under discussion. As well, it should be noted that no allowance has been made for possible attrition in the air fleets.

No contractual arrangements have as yet been made for either the submarines or corvettes mentioned in the 1991 Defence Policy Statement. They will therefore be considered within the various options rather than as part of the 1996 fleet.

No matter what choices are considered for future fleet roles and structures, the current security links to the United States will continue. Close cooperation in continental surveillance and defence will be a fundamental principle of future operations and the fleet capability must reflect it.

Option I -- A Regional Force Projection Navy -- The Currently Planned Fleet

This option assumes a continuation of the reduced global threat environment and the current strategic instability. The direct military threat to Canadian security remains low.

In this option the proposed acquisition of four to six fast patrol corvettes would be of a type similar to the Vosper Thorneycroft VIGILANCE class to permit off-shore operations. (See Appendix II for details). The three to six conventionally powered submarines would be designed with Air Independent Propulsion (AIP) to permit limited operations under the ice.

A broad range of core areas of operational expertise and capability would be maintained. Limited response would be available to most eventualities and, given time, the base would exist for expansion. This fleet structure would provide adequate surveillance and control in waters under Canadian jurisdiction. It would maintain a limited but balanced surface, sub-surface and air capability, relying on systems providing flexibility

and versatility. National commitments would be satisfied by the entire fleet, while international commitments would be carried out by the destroyers, frigates, operational support ships and the AURORAs.

Emphasis on protection of sea lines of communication would be reduced, but not abandoned. Arctic surveillance capability would be increased through the use of fixed systems and the new submarine fleet. Capability for support to other government departments would be enhanced with the acquisition of fast patrol corvettes.

Option II -- A Contiguous Seas Navy

This option assumes continuing global instability and growing regional conflict. There would be increased Canadian participation in coalition activities to counteract aggression and keep the peace. The direct military threat to Canada would remain low, but there would be some increase in the threat to the United States. There would be substantially increased pressure on ocean resources.

New major equipment acquisitions should include a further six CITY class frigates at two to three year intervals instead of the corvettes, another operational support ship and additional medium range coastal patrol aircraft. ANNAPOLIS, NIPIGON and the submarine fleet should be disposed of, the latter without replacement.

The Navy would have increased capability to carry out both surveillance and control in waters under Canadian jurisdiction. Both frigates and MCDVs would be employed in national roles. The capability for command and control and sustainment of global operations in support of foreign policy would be enhanced.

Option III -- An Enhanced Territorial Navy

This option assumes a continuing amelioration of the global military threat environment and no change to strategic stability. Growing population, migration of people and increasing demand for food and resources would pose an increasing direct low intensity threat to Canadian security.

A Polar icebreaker would be acquired as part of this option. A small fleet of small offshore patrol vessels would be acquired, similar to the British CASTLE class. These would be capable of landing and refuelling a helicopter and would possess good endurance. Additional medium range coastal patrol aircraft and light observation helicopters would be acquired. ANNAPOLIS, NIPIGON and the submarine fleet would be disposed of without replacement.

There will be a greater requirement for low intensity national operations, particularly in the Arctic, on the fishing grounds and around the oil and gas fields. This fleet structure would enhance surveillance and control in all three oceans. Residual global capability will be maintained with the destroyers, frigates, operational support ships and the AURORAs.

Option IV -- A Coastal Navy -- Minimalist Defence

This option assumes a continuing amelioration of the global threat environment, a concurrent increasing focus on a nationally oriented, low intensity security policy and increased budget constraints. The direct military threat to Canadian security will remain low.

Given these conditions, the four TRIBAL class destroyers and ANNAPOLIS and NIPIGON should be paid off at the end of their useful life without replacement. The submarine fleet should be retired without replacement at the earliest opportunity. A small fleet of small offshore patrol vessels should be acquired, similar to the British CASTLE class. (See Appendix II for details). These should be capable of landing and refuelling a helicopter and possess good endurance.

Overall fleet capability requirements would increasingly focus on surveillance and sea control within the territorial seas. A limited ASW capability would be maintained. National commitments would be satisfied by the entire fleet, with the coastal patrol aircraft and the MCDVs carrying the surveillance roles and the patrol craft fulfilling both the surveillance and policing function. International commitments would be carried out by

the frigates, supported by the AORs and the AURORAs. The capability of global deployment would be maintained but only for a small force at reduced readiness and limited to a single deployment without replacement.

VI EVALUATION OF OPTIONS

General

The evaluation of the options for the Canadian Navy involves the assessment of their suitability in satisfying government policy and in meeting the criteria described in Chapter V. A summary of the comparison of the options is shown in Table I.

Balance

The attempt to respond to the full range of traditional maritime tasks inherent in the announced defence policy is neither economically nor militarily sound. With a fleet divided between two coasts and consisting of small numbers of differing types of vessels in addition to the diminishing core of surface escorts, the resulting capability will be insufficient to fully satisfy national requirements or to make a significant difference to an alliance.

This, in fact, has been the situation confronting Canada for over forty years, during which time the Navy has progressively moved away from a balanced, general purpose navy. Faced with continuing funding constraints, increasing unit capital costs and a significantly different strategic environment, it now must confront the same decisions which were faced over the roles of cruisers and fleet destroyers in the late 1950s and carrier aviation in the late 1960s; this time the question is that of submarines and/or corvettes.

Submarines

Canada first considered the acquisition of its own submarine fleet in the late 1950s as an alternative to the British loan of a squadron. Early plans examined the possibility of nuclear submarines but foundered on the high cost.[86] Several years of study ultimately led to the decision in 1962 to purchase three OBERON class submarines from Britain.

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[86] Rear Admiral S. Mathwin Davis, "It Has All Happened Before: The RCN, Nuclear Propulsion and Submarines - 1958-68", *Canadian Defence Quarterly*, Autumn 1987, pp.34-40.

These have served to provide anti-submarine warfare (ASW) training to the Canadian Navy and allies as well as a limited surveillance and offensive capability.

The change in focus to a more offensive submarine role developed prior to the 1987 White Paper, which anticipated dramatically changed operations based on the potential of nuclear power. Since the late 1970s the OBERONs had conducted anti-submarine surveillance barrier patrols in support of the strategic deterrent of the United States.[87] Despite the abandonment of the nuclear submarine, the subsequent proposals for acquisition of conventional boats, (perhaps with air independent propulsion -- AIP), have continued to be based on anti-submarine surveillance and under-ice interdiction.[88]

When the Senate conducted its 1983 review of maritime defence, it described in detail the wartime roles of submarines, but noted that

> ...they are quintessentially weapons of war and would be able to contribute little to the accomplishment of the ancillary duties assigned to MARCOM in peacetime. Their peacetime contribution would consist of their significant deterrent capability, underwater surveillance and the training of surface and air ASW forces.[89]

With the changing strategic climate the deterrent capability requirement is diminished and fleet flexibility is increasingly important. The direct submarine threat against Canada and continental North America is declining with the collapse of the Soviet Union -- it is less and less probable that the Commonwealth of Independent States could consider initiating hostilities against the West which represents their only possible source of assistance in restructuring their economies. Should they do so, however, the capability

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[87] Sean Finlay, "The Submarine Project", *Aerospace and Defence Technology SSN Forum*, March 1988, p. S-26.

[88] Laurie Watson, "Conventional Submarine Proposal Gets New Twist", *Forum*, Fall 1991, pp. 9-10.

[89] *Canada's Maritime Defence*, op. cit. p. 49.

to launch missiles from remote bastions eliminates the necessity of penetrating Canadian waters or their approaches. Further, the threat of interdiction of sea lines of communication is plausible only in support of a major (and equally unlikely) land offensive in Europe.

The submarine is not essential in the Canadian fleet of the future. Its only significant peacetime role is the provision of ASW training. Its primary offensive role and its lack of a demonstrated clear superiority over fixed systems for Arctic surveillance detracts from overall fleet flexibility in peacetime.

In wartime, the conventional submarine will be at a considerable disadvantage to nuclear powered opponents. Its under ice utility would be limited, even with air independent propulsion. It is noteworthy that the capability of open-ocean nuclear submarines to operate under the ice is limited because of their size and operating characteristics. Purpose-built submarines would be required for such operations, the likelihood of which is decreasing.[90] Even proponents of the conventional submarine acknowledge its limitations in comparison to alternate systems and question its cost effectiveness.[91]

In a time of a changing focus for the fleet, increased competition for funding and emphasis on versatility and flexibility, there is no justification for acquiring new submarines.

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[90] Waldo K. Lyon, "Submarine Combat In the Ice", *United States Naval Institute Proceedings*, February. 1992, pp. 33-40.

[91] Commander E.J.M. Young, "Submarines for the Canadian Maritime Forces", *Canadian Defence Quarterly*, Summer 1986, p. 26; Richard Compton-Hall, "Alternative Submarines -- Minitruders and Green Nukes", *Canadian Defence Quarterly*, December 1989, p. 17, and Rear Admiral F.W. Crickard, "Nuclear-Fuelled Submarines: The Strategic Rationale", *Canadian Defence Quarterly*, Winter 1988, p. 22. See also Rear Admiral S. Mathwin Davis, "'Le Mieux Est L'Enemi du Bien': The Nuclear-Powered Submarine Programme", *Canadian Defence Quarterly*, Autumn 1988. p. 54, who argues that improved fixed systems backed by conventional submarines outside the icepack would be an 'adequate' system. See also testimony of General Gérard Thériault to the House of Commons Standing Committee on National Defence and Veterans Affairs, 19 November 1991, p. 14:12.

Corvettes

The proposal to acquire a fleet of corvettes is problematic and would not enhance fleet flexibility.[92] The unique Canadian operating environment demands a ship which is essentially a light frigate. It is not yet clear what role is intended for the corvette. The policing function does not need a large corvette, while the military function involving blue water deployment capability demands more. Design and start up costs for such a programme would be high, stretching the available budget and still only producing a lower order warship. It would be more logical to continue with the current frigate design, building on success, achieving economies of scale and producing a homogeneous fleet. If more patrol vessels are required, the MCDV fleet could be similarly expanded.

Contributions to World Order and Stability

World order and stability are fundamental to Canadian military and economic security. The Navy can continue to make a useful contribution through participation in alliance operations to maintain or restore the peace. In so doing it contributes to the security of Canada's trading partners world wide, thus protecting the trade which is so vital to Canada.

The direct security threat to Canada will primarily affect ocean resources, demanding surveillance and policing. The policing function will continue to be a shared responsibility with other government agencies. A military threat of any significance would involve the implementation of the Canada -- US defence agreements.

The focus of maritime policy must be outwards, with the capacity to use the fleet for lower intensity operations at home. This does not imply designing a navy to meet alliance requirements, rather, it acknowledges the external role as a key component of potential activities. The future is uncertain and the threat to Canada, although perhaps different from the past, is no less real.

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[92] See Peter Haydon, "What's Wrong With Corvettes?", *Wings Newsmagazine 1991/92*, pp. 13-14 for a discussion of the capabilities and limitations of corvettes.

If Canada structured its Navy solely for national operations, its capacity to operate unilaterally or with other navies in a complex environment would rapidly evaporate. Government willingness to commit a less capable fleet to multi-national operations might also diminish, accelerating the decline. This is not guaranteed, however, and history amply demonstrates the readiness of governments to commit inadequate forces and the terrible consequences of such actions. Canadian credibility as a medium power determined to have a major international role in contributing to global stability would be compromised. Sovereignty would also be eroded as the United States would feel obliged to do more in areas of concern to Canada to ensure their own security.

Comparison of options

Options III and IV represent the two extremes of a nationally oriented naval structure. The former option provides for increased air surveillance and the capability of establishing a naval presence in the Arctic, but without specific military capabilities. The latter would provide the minimum capability in the Atlantic and Pacific, but would still be deficient in air resources. Arctic operations would be limited to infrequent air patrols.

If budgetary constraints force the Navy to adopt Option III or particularly Option IV, it would signal a significantly declining role for Canada in international maritime affairs, notwithstanding the excellence of the CITY class frigates and the quality of personnel. Lack of sustainment would eliminate distant deployments. A reversion to the "boom or bust" building cycle would ultimately destroy the capability of the Canadian shipbuilding industry to build modern warships while making a modern navy unaffordable.

Options I and II represent the greatest degree of flexibility in response to both national and international requirements. Both are relatively expensive, but the latter is the more cost-effective because a continued building programme in a standard design ship and a rationalized personnel and training system would afford economies. It is also more easily expanded in times of crisis. This is offset by the loss of the somewhat limited subsurface capability for operations in the Arctic and for surveillance operations in consort with the United States Navy.

The fleet proposed in Option II has the greatest flexibility to pursue a greater range of national and international security objectives. Given the uncertainty regarding global stability and the outward looking stance of Canadian foreign policy, such flexibility is increasingly important in the fleet of the future.

TABLE I **COMPARISON OF OPTIONS**

ASSESSMENT FACTORS	OPTION I	OPTION II	OPTION III	OPTION IV
General				
Cost	high	high	high	low
Support to shipbuilding industry	medium	high	medium	low
Operational training capability	medium	medium	low	low
Capability for mobilization/expansion	low	medium	low	low
Personnel training requirement costs	high	medium	medium	low
Capability of support to other govt. depts.	medium	medium	high	medium
Policing Function				
Three ocean coverage	medium	low	medium	low
Fleet flexibility	medium	high	low	low
Surveillance/coverage of the EEZ	high	high	high	medium
Military Function				
Combat capability	medium	high	medium	low
Deterrent capability	medium	medium	low	low
Sea denial capability	high	high	medium	low
Sea control capability	medium	high	low	low
Interoperability with allied navies	high	high	medium	low
Reach	medium	high	low	low
Sustainability	low	high	low	low
Fleet balance	high	medium	low	low
Diplomatic Function				
Instrument of influence	medium	high	low	low
Representation of Canadian technology	medium	high	medium	low

VII CONCLUSIONS

Notwithstanding the proposals contained in the new defence policy, the Canadian Navy of the future cannot satisfy national security requirements if it attempts to be all things to all people and to make limited attempts at maintaining all capabilities. To do so will only perpetuate the long-standing problem of insufficiency. As has been described earlier, the fleet continues to lack the resources to meet all assigned national tasks. At the very least, these must be satisfied. To do so requires more resources and greater fleet flexibility.

The requirements of Canadian foreign policy cannot be met if there is any further reduction of the size and capability of the fleet, both in terms of warships and underway logistic support. The modest Canadian naval contribution to the Gulf War stretched the Navy substantially. Had the conflict been prolonged it is doubtful that the level of commitment could have been maintained. Further, concurrent commitments could not have been met. A similar scenario in other parts of the world or in the Middle East after the closure of CFB Lahr will be even more demanding.

The uncertainty of the future challenges the Navy to maintain as much capability and flexibility as possible within the fleet structure. To this end, the development of a more homogeneous fleet is essential. This is best achieved by developing Option II, a contiguous seas navy, based on standard designs with as much commonality in systems as possible within the fleet.

It is time to make the decisions necessary for the future. The Canadian Navy should concentrate on a surface fleet with sufficient underway logistic support and strong air surveillance capabilities, affording it the flexibility to carry out both national and international roles within the limits inherent in the foreseeable future. The resulting fleet will have capacity to make a meaningful contribution to national and international security, maintaining the long-established reputation for professionalism and technological competence which has been the hallmark of the Canadian Navy.

APPENDIX I CANADA'S MARITIME INTERESTS

The maritime area

The total coastline of Canada measures 244,000 km including the circumference of all major and minor islands. Of greater significance is the size of the maritime area within the 200 nautical mile limits, its resources and accessability. This area encompasses 6,650,000 km^2, broken down as follows:

- East Coast 2,500,000 km^2
- Hudson's Bay 1,000,000 km^2
- Arctic 3,000,000 km^2
- West Coast 150,000 km^2

The two coastal areas are open to navigation year round and are rich fishing grounds. They are heavily travelled by international shipping and, on the East Coast, have substantial petroleum reserves.

Canada exercises military responsibility for approximately 11,000,000 km^2 on the East and West Coasts, including the areas under national economic control, as part of NATO and CANUS agreements.

The Canadian Arctic area represents a unique challenge. Militarily, it has the potential to be used as a relatively safe haven for missile-launching submarines targeted against Canadian and American vital areas. It can also be used as an alternate transit route to that of the Greenland-Iceland-UK Gap for submarines wishing to enter the Atlantic from the Arctic Ocean. Nonetheless, the possibility of such use is small considering the current ranges of submarine launched cruise and ballistic missiles, the

difficulty of conducting submarine operations in the Arctic in general and in the Canadian archipelago in particular, and the alternatives open to an adversary.[93]

From a commercial perspective, future surface access to the Arctic will be increasingly important for both exploration and exploitation of natural resources. Surface navigation is limited to a short season in the low Arctic, distances are large, the environment is challenging yet fragile. The high Arctic is essentially inaccessible except by the most powerful icebreakers.

The Fishing Industry

The fisheries, Atlantic and Pacific, have been important to Canada's economy for generations, the former being a key element in the European exploration and settlement of the country. Over 80,000 fishermen and 65,000 shoreworkers are employed in the industry, which accounts for a significant proportion of the Gross Provincial Product of the Maritime provinces.[94] More significantly, from 1979 onwards, Canada has been the world's leading exporter of fish products. In 1989, the most recent year reported, 78% of all fish products in Canada worth $2.4 billion, were exported, with 55% going to the United States.

The prognosis for the fishing industry, particularly in the Atlantic, is not good. Prediction of fish stocks is an inexact science, but it is clear that stocks of northern cod, the most valuable species, have dropped dramatically. The annual catch grew steadily until the late sixties and then declined as stocks were depleted. The extension of Canadian

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[93] Ronald G. Purver, "Arms Control Options in the Arctic" in Edgar J. Dosman, ed. *Sovereignty and Security in the Arctic*, London, Routledge, 1989, pp. 100-125. See also Waldo K. Lyon, "Submarine Combat in the Ice", *United States Naval Institute Proceedings*, February 1992, pp. 33-40, and Commander Peter T. Haydon, *The Strategic Importance of the Arctic: Understanding the Military Issues -- Strategic Issues Paper No 1/87*, Ottawa, Department of National Defence, 1987.

[94] Government of Canada, *Department of Fisheries and Oceans 1991-92 Estimates, Part III*, Ottawa, Department of Fisheries and Oceans, 1991. Although the fisheries represent only about 1% of GNP, they represent 20% of GPP for Newfoundland, 16% for Nova Scotia and Prince Edward Island, 5% for New Brunswick and 2.8% for British Columbia.

fisheries jurisdiction in January 1977, has not solved the problem. Increased Canadian participation,[95] improved fishing methods and the impact of high seas harvesting of migratory species by foreign fleets have all contributed to the declines. The impact of the cessation of the seal hunt in December 1987 may also be a factor, but is as yet unproven. Quotas were introduced in 1984 to counteract the decline and the Total Allowable Catch(TAC) for northern cod was planned to be reduced progressively from 258,000 tonnes in 1988 to 180,000 tonnes in 1993.[96] Nonetheless, virtually unrestricted fishing outside the 200 mile limit appears to be continuing[97] and the North Atlantic Fisheries Organization appears unable or unwilling to control it. The consequence is that the proportion of the stock capable of reproduction may have dropped by as much as 50% in 1991.[98] The Federal Fisheries Minister has, as a result, lowered the 1992 quotas to 65,000 tonnes.[99]

Supervision and enforcement of fishing regulations within the 200 nautical mile limit has been carried out by the Department of Fisheries and Oceans(DFO). The Canadian Navy has contributed increasing resources to assist in this task -- in 1991, in excess of 10% of ship days at sea. This has represented about 5% of the total effort. DFO puts inspectors on all foreign ships authorized to fish in Canadian areas and, as a result, the violations by them represent less than 5% of the total.

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[95] The total Canadian catch of northern cod from all contiguous offshore areas in 1974 was 155,000 tonnes, representing 22% of the total that year. In 1986 it had grown to 447,000 tonnes, representing 74%. See Government of Canada, *Resource Prospects for Canada's Atlantic Fisheries 1989-1993*, Department of Fisheries and Oceans, 1988.

[96] Fisheries and Oceans, *1991-92 Estimates*, *ibid.*

[97] Chris Marquardt, "Canada's Fishing Crisis", *Greenpeace*, Jan/Feb 1991, p. 23. Greenpeace observed this unrestricted fishing in September 1990.

[98] Jill Vardy, "Fishery Faces More Job Losses", *Financial Post*, 18 February 1992, p. 4.

[99] Jill Vardy, "Quotas on Cod are Cut", *Financial Post*, 25 February 1992, p. 3.

Undersea Resources

The quantity of undersea resources in the Canadian Exclusive Economic Zone is still not fully known and the processes of exploration and exploitation are in their early stages. Petroleum has been the major target. The East Coast off-shore, Beaufort Sea/Mackenzie Delta and the Arctic Islands hold 19.6% of the proven Canadian crude oil reserves. The latter two areas also hold 24.9% of the marketable natural gas reserves.[100] However, activity has declined steadily since 1986[101] as a result of the continuing low price of oil on the world market and, on the West Coast, by government restrictions on drilling on the continental shelf. The trend is exemplified by the decision of Gulf Canada to withdraw its 25% share from the Hibernia project.[102] Nonetheless, the discovered and potential reserves are significant and will be of increasing value over time.

One of the many contentious issues during the UN Conference on the Law of the Sea dealt with undersea resources and seabed mining. Within the Canadian Exclusive Economic Zone there has not been a great deal of exploratory work. There are indications of potentially valuable mineral deposits off the West Coast but virtually all exploration efforts have been applied to more economically viable deposits on land. The Arctic has considerable mineral potential and exploitation has been underway for several decades. The high cost of drilling and mining and the difficulty of transporting oil, gas and ore to processing facilities and markets have been limiting factors to date.

The Environment

The Law of the Sea negotiations, growing awareness and exploitation of resources in the Arctic and the *Manhattan* voyage through the Northwest Passage in 1969 all served to increase environmental concerns for Canada's oceans. Canada has neither led nor

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[100] Government of Canada, *The Crude Petroleum and Natural Gas Industry*, Ottawa, Statistics Canada, pp. 26-213, 1989.

[101] Government of Canada, *The Canadian Oil and Gas Lands Administration Annual Report*, Ottawa, 1990.

[102] Peter Morton, "Hibernia on Hold", *Financial Post*, 15-17 February 1992, p. 1.

followed, but has made some progress in marine environmental regulation.[103] Dumping of wastes at sea is controlled by the Ocean Dumping Control Act, restricting the nature of materials which may be dumped. The Arctic Waters Pollution Prevention Act, proclaimed in 1972, declared a 100 nautical mile pollution prevention zone in the Arctic. It limits waste disposal from ships, sets out ship navigation and safety requirements and restricts movements in sixteen designated shipping safety zones.

Public sensitivity towards ocean pollution has been heightened by the extensive contamination which followed the sinking in December 1988, of an oil barge off Washington State and the grounding of the *Exxon Valdez* in Alaska in March 1989. These events demonstrated both the potential for significant damage on the Canadian coast and the enormous costs involved in cleanup and lost revenues from ocean industries.

Expansion of off-shore mineral exploration will be conditioned by enhanced safety requirements as well as environmental concerns. The *Ocean Ranger* disaster in 1982 and the subsequent Royal Commission of Inquiry clearly demonstrated the existing inadequacies.[104] As operations expand within the Exclusive Economic Zone, there will be a demand for parallel improvement in monitoring and search and rescue capabilities.

Trade

Canada is a major trading nation, with annual exports accounting for 21.7% of GDP in 1990. The importance of trade in a maritime sense requires scrutiny, however. As can be seen in Table II, Canada's total imports and exports have grown by a factor of seven since 1971, but the proportion going to and from the United States has remained essentially 70% for imports and 75% for exports (see Tables III and IV). It is noteworthy

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[103] David VanderZwaag, "Canada and Marine Environmental Protection: The Changing Tides of Law and Policy" contained in Donald McRae and Gordon Munro, eds. *Canadian Oceans Policy: National Strategies and the New Law of the Sea*, Vancouver, University of British Columbia Press, 1989, pp. 95-132.

[104] Ted L. McDorman, "Canadian Offshore Oil and Gas: Jurisdiction and Management Issues in The 1980s and Beyond", contained in McRae, *Canadian Oceans Policy*, op.cit. pp. 39-68.

that, of the trade with the United States which goes by sea, approximately 35% of Canadian exports and 76% of imports are carried in the Great Lakes.[105]

The proportion of trade with Europe has grown modestly in recent years while that with all other areas of the world, including Japan and South West Asia, after a period of growth in the early 1980's, has levelled off. This is not to deny the importance of trans-oceanic trade, but it should be evident that patterns are not changing significantly. Further, exports continue to be made up of raw materials, grain and paper. Imports are primarily crude petroleum, iron ore and alumina. Only in the matter of imports from Asia is there an increase in the proportion of finished goods.

Canada is not self-sufficient in energy or essential raw materials. Petroleum requirements for Quebec and the Maritimes are met with imports. Crude oil imports have grown from 15.8 million m^3 in 1985 to 31.8 million m^3 in 1990.[106] The primary source has been the United Kingdom, with Nigeria, Venezuela, Norway, Saudi Arabia and the United States the major suppliers, in that order.

A study conducted in 1986[107] identified six strategic commodities either not found in Canada or produced in insufficient quantities to satisfy industrial, military or civilian requirements in an emergency. These were bauxite, alumina, fluorspar (used in the manufacture of steel, glass and ceramics, aluminum smelting and the chemical industry), phosphate rock for fertilizers, bentonite (used in adhesives,ceramic fillers and cement), and manganese (used in the manufacture of steel). Only 1.4% of these were imported in Canadian-flagged ships, 56% by NATO-flagged ships and 36.7% in flag-of-convenience shipping. The ratio is similar for oil tankers.

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[105] Government of Canada, *Shipping in Canada*, Ottawa, Statistics Canada, 1989, pp. 27, 35.

[106] Government of Canada, *Imports by Commodity*, Ottawa, Statistics Canada, December 1990.

[107] Government of Canada, *Canada's Strategic Imports -- Shipping Considerations*, Ottawa, Transport Canada, 1986.

Shipping

Canada has only 209 self-propelled ships of 1000 gross tons or over as of 31 December 1988.[108] Of these, 101 are employed on the Great Lakes. Within the total number there are only eight open ocean capable ferries and seven general cargo vessels over 5,000 tons. The majority of the ferries operate in fixed service.

Shipbuilding

The Canadian shipbuilding and ship repairing industry[109] reached its peak in World War II, employing more than 60,000 personnel. In the post war period the early years were taken up with building a modern commercial fleet and, in the fifties and sixties, new fleets for the Navy and the Coast Guard. During this period employment varied between a high of 19,456 and a low of 9,814. Lower cost construction in Europe and Asia subsequently eroded commercial orders. In the past decade commercial orders have dropped by over 90% and employment below 7,000. Concurrently there was an inconsistent pattern of government orders, long intervals between them and short building runs. The result has been no economies of scale and a dramatic decline in the numbers of shipyards capable of building or repairing warships. Of the yards which built the ST LAURENT class and its follow-ons, only Marine Industries is capable of building warships, while Vickers, Victoria Machinery Depot and Burrard Dry Dock have gone out of business. The skilled work force has also declined. Its reconstitution, as demonstrated in the Canadian Patrol Frigate programme, is difficult and very expensive.

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[108] Government of Canada, *Canadian Merchant Fleet -- 1988 Annual Lists*, Ottawa, National Transportation Agency of Canada, 1988.

[109] Cdr. J.Y. Clarke, "Canada's Shipyards -- Yesterday, Today and -- Will There be a Tomorrow?", *Maritime Affairs Bulletin No 1/88*, pp. 1-4.

TABLE II MERCHANDISE IMPORTS AND EXPORTS ($ MILLION)

	EXPORTS TOTAL	EXPORTS NON-US	IMPORTS TOTAL	IMPORTS NON-US
1971	17,782	5,716	15,314	4,587
1972	20,222	6,022	18,272	5,678
1973	25,649	8,128	22,726	6,636
1974	32,738	10,938	30,903	10,251
1975	33,616	11,557	33,962	10,904
1976	38,166	12,353	36,608	11,484
1977	44,495	13,299	41,523	12,074
1978	53,361	15,549	49,048	14,203
1979	65,582	20,499	61,157	16,667
1980	76,681	27,706	67,903	20,560
1981	84,432	28,332	77,140	24,363
1982	84,393	26,296	66,739	19,667
1983	90,556	24,168	73,098	20,377
1984	111,330	26,514	91,493	25,600
1985	119,061	25,268	102,669	29,263
1986	120,318	26,992	110,374	33,947
1987	126,226	29,621	115,119	36,134
1988	138,435	35,818	128,321	39,916
1989	141,462	35,991	134,528	41,052
1990	146,057	35,775	135,259	42,367

Source: Government of Canada. *Canadian Economic Observer -- Historical Statistical Supplement 1990/91*, Statistics Canada.

TABLE III **CANADIAN MERCHANDISE IMPORTS BY REGION AS A PERCENTAGE OF CANADIAN TRADE**

	USA	JAPAN	OECD	OTHERS
1971	70.0	5.2	15.5	9.2
1972	68.9	5.8	15.6	9.6
1973	70.8	4.4	14.4	10.2
1974	66.8	4.6	13.7	13.6
1975	67.9	3.5	13.1	15.5
1976	68.6	4.1	11.8	15.4
1977	70.9	3.4	11.8	13.0
1978	71.0	4.6	12.5	11.9
1979	72.7	3.5	12.2	11.6
1980	69.7	4.1	11.5	14.7
1981	68.4	5.2	11.2	15.2
1982	70.5	5.3	11.8	12.4
1983	72.1	6.0	10.8	11.1
1984	72.0	6.0	11.4	10.6
1985	71.5	5.9	12.8	9.8
1986	69.2	6.9	13.9	10.0
1987	68.6	6.5	14.7	10.2
1988	68.9	6.2	14.7	10.2
1989	69.5	6.2	13.7	10.6
1990	68.7	6.1	14.7	10.6

Source: Government of Canada. *Canadian Economic Observer -- Historical Statistical Supplement 1990/91*, Statistics Canada.

TABLE IV **CANADIAN MERCHANDISE EXPORTS BY REGION AS A PERCENTAGE OF CANADIAN TRADE**

	USA	JAPAN	OECD	OTHERS
1971	67.9	4.7	17.6	9.9
1972	70.2	4.8	15.1	9.9
1973	68.3	7.0	15.2	9.5
1974	66.6	6.8	15.9	10.8
1975	65.6	6.4	15.2	12.9
1976	67.6	6.1	14.5	11.7
1977	70.1	5.4	13.1	11.3
1978	70.9	5.6	11.6	11.9
1979	68.7	5.9	13.6	11.7
1980	63.9	5.6	16.0	14.6
1981	66.4	5.4	13.4	14.4
1982	68.9	5.5	11.4	14.3
1983	73.3	5.3	9.3	12.1
1984	76.2	5.1	8.1	10.6
1985	78.8	4.9	5.8	8.9
1986	77.6	4.8	8.5	9.1
1987	76.5	5.4	9.4	8.7
1988	74.1	6.0	10.0	9.9
1989	74.6	6.0	10.7	8.7
1990	75.5	5.2	10.4	8.8

Source: Government of Canada. *Canadian Economic Observer -- Historical Statistical Supplement 1990/91*, Statistics Canada.

APPENDIX II COMPARISON OF PATROL CRAFT CAPABILITIES

Class	CASTLE	VIGILANCE	HAMILTON
Length (metres)	81	81	115
Displacement (tons)	1427	1135	3050
Speed (knots)	19.5	30	29.5
Endurance (nautical miles)	10,000	5,500	14,000
Crew	50	54	151
Weapons systems	1x30mm	1x76mm 2x40mm 8xExocet	1x5in 1x3in 2x20mm 1xPhalanx 8xHarpoon
Propulsion	diesel	diesel	combined diesel or gas turbine
Helicopter	seaking platform	seahawk	

Source: *Jane's Fighting Ships -- 1990-91.*

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